

DISRUPTIVE BEHAVIOR TREATMENT PROGRESS AS A FUNCTION OF YOUTH  
DIAGNOSIS

A THESIS SUBMITTED TO THE GRADUATE DIVISION OF THE  
UNIVERSITY OF HAWAI‘I AT MĀNOA IN PARTIAL FULFILLMENT  
OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

IN

PSYCHOLOGY

OCTOBER 2016

By

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Keywords: Disruptive behavior, ADHD, depression, treatment response, psychopathology

## **Acknowledgements**

This study is a result of the partnership between the University of Hawai‘i at Mānoa and the State of Hawai‘i Child and Adolescent Mental Health Division. The author acknowledges the counsel and effort of Dr. Charles Mueller. I am very grateful for your guidance, support, and advice. The author also recognizes the contributions of Dr. Brad Nakamura and Dr. Kentaro Hayashi for their wisdom and expertise. I would also like to thank Sonia Izmirian, Matt Milette-Winfree, Dr. Ryan Tolman, Pua Hee, Dr. Trina Orimoto, and the Mueller lab undergraduate research assistants for their contributions.

## Abstract

Disruptive behavior problems, the most common reason youth are referred for public mental health treatment, develop along multiple causal pathways often reflected in patterns of psychiatric diagnoses. Disruptive behavior treatment and youth response to such treatment might vary as a function of etiology/diagnostic differences. I predicted that youth with attention-deficit/hyperactivity disorder would respond worse and youth with depressive mood disorders would respond better than youth without either disorder on therapist-reported disruptive behavior treatment targets.

Clinical data from youth ( $N = 613$ ) that received intensive in-home (IIH) services from the State of Hawai'i, Child and Adolescent Mental Health Division (CAMHD) with a diagnosis (primary or comorbid) of (a) attention-deficit/hyperactivity disorder (ADHD), combined or primarily hyperactive/impulsive subtypes, but no mood disorder ( $n = 193$ ); (b) depressive mood disorder; but no ADHD ( $n = 164$ ); or (c) disruptive behavior disorder, but without any ADHD or depressive mood diagnosis ( $n = 256$ ), were compared on clinician reported therapeutic progress on disruptive behavior treatment targets. A three-level multilevel model approach (level-1: progress over time, level-2: client factors, and level-3: therapist factors) was utilized to examine rate of change and final progress rating after at most six months of treatment by diagnostic category. These analyses also examined and controlled for the effects of additional client, therapist, and treatment characteristics.

The relationship between diagnostic group and disruptive behavior problem (DBP) progress ratings was not significant. However, and contrary to predictions, youth in the ADHD group trended towards higher progress ratings and youth in the depressive mood group trended towards lower progress ratings ( $p < .08$ ). These findings suggest that usual care might be more

successful in disruptive behavior treatment for youth exhibiting more prototypical disruptive behavior problems (e.g., with ADHD). Potential but unexplored contributing factors might include an unstructured approach to treatment in usual care, the possible greater utilization of practices supported by the evidence base for both ADHD and DBD, and greater therapist proficiency with or focus on behavioral relative to cognitive interventions. There was a positive, significant relationship between DBP progress ratings and higher age, lower total CAFAS impairment ratings, fewer DBPs endorsed in a given month, absence of a substance use disorder, and treatment length of at least 180 days. Future research directions might investigate whether specific therapeutic practices or more structured treatment programs, such as Multisystemic Therapy, impact DBP treatment response differentially across diagnostic profiles or other indicators of developmental psychopathology.

## Table of Contents

Acknowledgements.....	ii
Abstract.....	iii
List of Tables.....	viii
List of Figures.....	ix
List of Appendices.....	x
List of Abbreviations.....	xi
Introduction.....	1
Overview of Disruptive Behavior Problems.....	1
ADHD and Disruptive Behavior Problems.....	3
Depression and Disruptive Behavior Problems.....	6
Disruptive Behavior Problems without Impulsivity or Depressive Moods.....	8
Treatment Response across the Various Etiologies, Comorbidities and Associated Features of Disruptive Behavior Problems.....	9
Current Study.....	12
Method.....	13
Data Source.....	13
System of Care.....	13
Participants.....	14

Youth Participants.....	14
Therapist Participants.....	19
Human Subjects Consideration.....	21
Measures.....	21
Monthly Treatment Progress Summary (MTPS;CAMHD, 2005; Appendix A)...	21
Child and Adolescent Functional Assessment Scale (CAFAS; Hodges, 2000; Appendix C).....	23
CAMHD Diagnostic Procedures.....	24
Data Analysis.....	24
Data Preparation.....	24
Multilevel Modeling (MLM) Analyses.....	25
Power analysis.....	28
Results.....	28
Data Preparation and Missing Values.....	28
Time-only model.....	32
Level-one model.....	33
Level-two model.....	34
Level-three model.....	36
Follow-Up Analyses.....	38

Discussion.....	40
Appendices.....	49
References.....	65

## List of Tables

Table 1: <i>Youth demographic and clinical information broken down by diagnostic group and total sample size (n = 613)</i> .....	18
Table 2: <i>Therapist information by total sample (N = 172)</i> .....	20
Table 3: <i>Example of how time was coded to be the “end status” for clients with different treatment episode lengths</i> .....	32
Table 4: <i>Multilevel Models Predicting DBP Progress Ratings (N=613)</i> .....	37



## **List of Figures**

<i>Figure 1.</i> Flow diagram of sample selection among youth receiving intensive in-home treatment from Child and Adolescent Mental Health Division.....	16
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## **List of Appendices**

Appendix A: Monthly Treatment and Progress Summary (MTPS).....	49
Appendix B: MTPS Instructions and Codebook.....	52
Appendix C: Child and Adolescent Functional Assessment Scale (CAFAS).....	64

## **List of Abbreviations**

ADHD.....	Attention-Defecit/Hyperactivity Disorder
AIC.....	Akaike information criterion
ANOVA.....	Analysis of Variance
CAFAS.....	Child and Adolescent Functional Assessment Scale
CD.....	Conduct Disorder
CAMHD.....	Child and Adolescent Mental Health Division
DBD-NOS.....	Disruptive Behavior Not Otherwise Specified
DBD.....	Disruptive Behavior Disorder
DBP.....	Disruptive Behavior Problem
DSM.....	Diagnostic and Statistical Manual of Mental Disorders
ICC.....	Intraclass Correlation
MLM.....	Multilevel Modeling
MTPS.....	Monthly Treatment Progress Summary
ODD.....	Oppositional Defiant Disorder
PDEB.....	Practice Elements Derived From the Evidence-Base
PMES.....	Practices with Minimal Evidence Support

## **Introduction**

Behavior problems that include oppositionality, noncompliance, aggression, and delinquency are the most commonly diagnosed psychiatric disorders in public mental health care (Garland et al., 2001), and disruptive behavior patterns are responsible for the highest rate of referral for youth mental health services (Hinshaw & Lee, 2003). Within one statewide public mental health system, disruptive behavior disorders (oppositional defiant disorder and conduct disorder) were the most frequent primary diagnoses among youth referred for service, although accompanied by considerable comorbidity (Mueller, Tolman, Higa-McMillan, & Daleiden, 2010). Youth with disruptive behavior problems are a diverse group with high rates of additional diagnoses, particularly in clinical samples (Hinshaw & Lee, 2003). Disruptive behavior problems can begin early or later in life, have more or less involvement of negative emotions and/or emotional dysregulation (see for instance literature on proactive and reactive aggression), might or might not include impulsivity and behavioral dysregulation, and might or might not reflect underlying or additional emotional challenges (e.g., anxiety and avoidance fueled disobedience; unhappiness expressed in misbehavior) as is implied in the term “acting out” used at times to describe such youth. It remains unclear whether certain forms of disruptive behavior problems might be more or less amenable to intervention.

## **Overview of Disruptive Behavior Problems**

Disruptive behaviors are characterized by antisocial behaviors that violate the rights of others or fail to conform to the expectations of authority figures or societal norms, with many of these behaviors correlated with each other and commonly clustered under the dimensional trait of antisocial behavior (Frick, 1998). Conduct disorder (CD), oppositional defiant disorder (ODD), and disruptive behavior disorder not otherwise specified (DBD-NOS) comprise the

disruptive behavior disorders (DBDs) found within the current DSM (Kutcher et al., 2004), while adjustment disorder with disturbance of conduct also concerns disruptive behaviors, and for the purposes of this study, DBD shall refer to these four DSM-IV-TR diagnoses. Youth with these disorders are heterogeneous in the types of disruptive behaviors displayed, causal factors involved in their development, and the course of symptoms and response to treatment, presenting a difficult problem for clinical mental health practitioners (Frick, 1998).

Prevalence rates of disruptive behavior disorders in community samples are considerable, with approximately 5-9% of youth meeting criteria for CD or ODD (Boylan, Vaillancourt, Boyle, & Szatmari, 2007; Canino, Polanczyk, Bauermeister, Rohde, & Frick, 2010; Lahey, Miller, Gordon, & Riley, 1999). Disruptive behavior disorders are common in youth receiving public mental health services, with research across public mental health sectors finding approximately one in four youth meeting criteria for CD and one in six meeting criteria for ODD (Garland et al., 2001). Disruptive behavior problems are associated with high levels of comorbidity (e.g., Angold, Costello, & Erkanli, 1999; Kazdin, 1997); negative societal impact including harm to others, school truancy, legal issues, and public expenditures (e.g., Foster et al., 2005; Scott, Knapp, Henderson, & Maughan, 2001); and long-term sequelae, including poor interpersonal relationships, workplace problems, lower academic achievement, increased criminal behavior, and greater mortality rates (Burke, Rowe, & Boylan, 2014; Kazdin, 1997).

There are many different treatment interventions that can mitigate the long term risks associated with disruptive behavior problems. Promising treatment methods include parent-training programs, Multisystemic Therapy, social skills training, cognitive-behavior therapy, assertiveness training, problem-solving training, anger control training, Multidimensional Treatment Foster Care, and Parent-Child Interaction Therapy (e.g., Brestan & Eyberg, 1998;

Chorpita et al., 2011; Eyberg, Nelson, & Boggs, 2008). Common treatment elements are found across many evidence-based treatments for disruptive behavior, including parent-child relationship building, the application of positive reinforcement principles, psychoeducation, homework, and reviewing goals and progress (Garland, Hawley, Brookman-Frazee, & Hurlburt, 2008). However, the effectiveness of these practices for youth in community settings is not fully clear; for example, youth in community settings might differ from those in efficacy studies on key variables, such as coming from a more adverse family environment (e.g., Baker-Ericzén, Hurlburt, Brookman-Frazee, Jenkins, & Hough, 2010).

### **ADHD and Disruptive Behavior Problems**

Disruptive behavior problems are not unique to youth with DSM disruptive behavior disorders, as behavioral problems are frequently seen in other patterns of psychopathology. Hyperactive-impulsive-attention problems show associations with behaviors thought to be aggressive, oppositional, and noncompliant. Attention-deficit/hyperactivity disorder frequently co-occurs with disruptive behavior disorders; 40-70% of children and adolescents with ADHD are estimated to have comorbid ODD and/or CD, and 40-60% of children with ODD and/or CD are estimated to have comorbid ADHD (Newcorn & Halperin, 2000). Despite these comorbidity rates, evidence suggests DBDs and ADHD are separate, additive problems, representing neither the same construct nor a distinct, singular construct when in combination (Waschbusch, 2002), and ADHD is best considered primarily as a neurodevelopmental, rather than behavioral, condition (Frick & Nigg, 2012).

Though distinct from disruptive behavior problems, hyperactive-impulsive-attention problems might be considered disruptive in their own right. Youth with ADHD show increased levels of aggression compared to control groups without ADHD (Connor, Chartier, Preen, &

Kaplan, 2010), and it has been suggested that the screening, diagnosis, and management of ADHD symptoms should take into account oppositional and aggressive symptoms, whether as a comorbid disruptive behavior disorder or as subsyndromal patterns of behavior (Connor, Steeber, & McBurnett, 2010; King & Waschbusch, 2010). Impulsivity and hyperactive behavior, both symptoms of ADHD, show particular associations with anger and aggression (King et al., 2009; Vigil-Colet & Codorniu-Raga, 2004), with hyperactive/impulsive behaviors predictive of oppositional defiant and conduct problems independent of inattentive symptoms (Pardini & Fite, 2010). Anger and aggression are particularly symptomatic of comorbid ADHD and disruptive behavior disorder, with comorbid youth especially reactive to provocation (Waschbusch et al., 2002).

Disruptive behavior problems in youth with hyperactive-impulsive-attention problems are associated with more difficulties in course and associated problems compared to those in youth without hyperactive-impulsive-attention problems. Children with hyperactive-impulsive-attention problems and comorbid conduct problems exhibit earlier onset and greater persistence of problematic behaviors than those with conduct problems alone, suggesting a distinct developmental trajectory (Waschbusch, 2002). In one longitudinal study, ADHD symptoms predicted increases in disruptive behavior problems over time (Pardini & Fite, 2010). In another study, ADHD in childhood predicted conduct disorder behaviors in adolescence, even in a proband of children who did not exhibit conduct behaviors in childhood (Mannuzza, Klein, Abikoff, & Moulton, 2004). A diagnosis of ADHD at an early age (i.e., toddlerhood) has been connected to a developmental pathway that leads into ODD by preschool, childhood-onset CD by elementary school, and substance use disorders in adolescence, an “early-onset and persistent” manifestation of disruptive behavior problems that is regarded as more severe and

more difficult to treat (e.g., Beauchaine, Hinshaw, & Pang, 2010; Loeber & Hay, 1997; Stalk, Love, Hoe, Onomura, & Mueller, 2011). However, the early diagnosis of ADHD does not necessarily mean an earlier onset of CD, as some youth with ADHD develop CD in adolescence (Loeber, Green, Lahey, Frick, & McBurnett, 2000). An examination of longitudinal studies focused on ODD found that those youth who met criteria for ODD and persisted with ODD symptoms over time also began with more ADHD symptoms, compared to those who never met ODD diagnostic criteria (Boylan et al., 2007). Among three empirically-supported ODD symptom factors, ADHD shows a particularly strong association with the factor conceptualized as “argumentative/defiant” or “headstrong” (Stringaris & Goodman, 2009a; American Psychiatric Association, 2013), and this argumentative/defiant dimension was the only predictor of ADHD at follow-up in a longitudinal study of ODD dimensions (Stringaris & Goodman, 2009b).

Co-occurring disruptive behavior and hyperactive-impulsive-attention problems have been linked to particularly adverse impairment and outcomes. ADHD is linked to more aggressive and suicidal behavior in prepubertal youth (Goodman, Gerstadt, Preffer, Stroh, & Valdez, 2008), with impulsivity associated with increases in both self-mutilation (Herpertz, Sass, & Favazza, 1997), and suicide completion at younger ages (McGirr et al., 2007). Aggressive behavior might be more debilitating when occurring with ADHD compared to without ADHD (Carlson, Tamm, & Gaub, 1997), and ADHD leads to more peer rejection, and more severe, aggressive, and persistent conduct problems in youths with a conduct disorder (Abikoff & Klein, 1992; Frick, 1998). ADHD behaviors might be linked to criminal acts, with some evidence to suggest that youth with high levels of both aggression and ADHD symptoms commit more criminal offenses over time than those rated high only on aggression (Loeber et al., 2000). A



combination of conduct problems and hyperactive-impulsive-attention problems might also be a risk factor for adult psychopathy (Johansson, Kerr, & Andershed, 2005), and ADHD might exacerbate the relationship between disruptive behavior disorders and both callous-unemotional traits and aggression (Becker, Luebke, Fite, Greening, & Stoppelbein, 2013). These findings suggest a disruptive behavior problem profile featuring co-occurring hyperactive-impulsive-attention problems that can be particularly problematic to clients as well as society at large.

### **Depression and Disruptive Behavior Problems**

Behaviors and emotions associated with disruptive behavior problems might also manifest in youth with depressive mood. Depressive mood has been linked to various forms of aggression, including elevated rates of spousal aggression, spousal homicide, physical child abuse, and self-directed (i.e., suicide) aggression (Dutton & Karakanta, 2013). Anger, an emotion associated with disruptive behavior problems, might also be more frequent among those with depressive mood. Depressive mood disorders have been linked to an increased frequency of “anger attacks” (Painuly, Grover, Gupta, & Mattoo, 2011), and depression in youth might be connected to an increased use of aggressive coping behaviors when in an angry state (Goodwin, 2006). Regarding diagnosis, depressive mood disorders and disruptive behavior disorders co-occur at a frequency greater than that which would be expected by chance (Angold et al., 1999; Bird, Gould, & Staghezza, 1993).

Irritability might play a key role in the relationship between depressive symptoms and certain forms of disruptive behavior problems in youth. The *DSM-IV-TR* includes a criterion for irritable mood in the diagnosis of Major Depressive Disorder and Dysthymic Disorder for children and adolescents (American Psychiatric Association, 2000). Irritability is characterized by touchiness, a low threshold for annoyance and the expression of anger, and is listed as a

symptom across multiple diagnoses, including ODD (Stringaris, 2011). ODD is a significant predictor of a later diagnosis of depression in youth, with evidence suggesting that ODD might be the most significant predictor of young adult depression, even above childhood depression (Burke, Loeber, Lahey, & Rathouz, 2005; Copeland, Shanahan, Costello, & Angold, 2009). In particular, the ODD factor dimension labeled variously as “negative affect” or “irritability” is predictive of a later diagnosis of depression (Burke, Hipwell, & Loeber, 2010; Loeber, Burke, & Pardini, 2009).

Co-occurring disruptive behavior and depressive mood problems might demonstrate difference courses compared to disruptive behavior problems without mood concerns. In a study of youth with different trajectories of conduct problem onset and persistence, Barker, Oliver and Maughan (2010) found that youth with early-onset and persistent conduct problems had significantly higher odds of meeting criteria for CD, ODD, ADHD and anxiety diagnoses compared to both adolescent-onset conduct problem and childhood-limited conduct problem youth, but did not have significant differences in the odds of a depression diagnosis. This suggests that issues with depression might be an exception in being no more frequent among the most persistent conduct problem cases compared to other cases of conduct problems. A longitudinal study on different courses of disruptive behavior problems found youth with both persistent and late-onset ODD experienced increased mood disorder symptoms after a four year follow-up, but only the persistent group saw increased ADHD and CD symptoms, further suggesting different comorbid relationships between persistent and late-onset disruptive behavior, with late-onset possibly showing a more singular relationship with mood symptomology (August, Realmuto, Joyce, & Hektner, 1999; Boylan et al., 2007; Stalk et al., 2011). In another longitudinal study by Boylan, Vaillancourt, and Szatmari (2012), all youth

who developed high levels of depressive symptoms had pre-existing moderate or high levels of oppositional symptoms, suggesting a developmental track of youth depression that begins with oppositionality. Moffitt, Caspi, Harrington, and Milne (2002) identified a group of youth whose early and severe disruptive behaviors desisted in adolescence with the emergence of internalizing issues. These findings, taken together, suggest a developmental track of disruptive behavior issues that leads into adolescent and adult depressive mood problems, possibly due to different underlying mechanisms such as irritability.

### **Disruptive Behavior Problems without Impulsivity or Depressive Moods**

Disruptive behavior problems can and do occur independent of ADHD or mood disorder related problems. As with any behavior, disruptive behaviors can be learned by straight forward conditioning and observation, and might not emerge from related concerns such as emotional or impulse control problems. Disruptive behavior patterns might develop through multiple influences, including socioeconomic, school-related, and community-wide factors (Hinshaw & Lee, 2003). Parent-child interaction that is coercive or rigid, maternal depression, or permissive and/or overly punitive parenting styles might lead to the development of child and adolescent disruptive behavior (Granic & Patterson, 2006). Experiences in childhood such as physical abuse or an inconsistent family environment can lead to distorted cognitions that increase the frequency of disruptive behaviors (Kimonis & Frick, 2010). Peer socialization can lead to the development of disruptive behavior patterns through peer rejection, association with deviant peers, or gang membership (Hinshaw & Lee, 2003; Kimonis & Frick, 2010).

Disruptive behavior might also manifest with callous-unemotional (CU) traits, characterized by low empathy, a lack of guilt or concern about performance, and shallow affect, that seem to designate a subgroup of youth with more severe and persistent disruptive behavior

problems (Frick & Viding, 2009). As a lack of emotional experience is characteristic of CU traits, youth with these traits might be less at risk for comorbid problems with depressive mood. Results from Pardini and Fite (2010) found that CU traits negatively predicted later problems with internalizing issues. CU traits might have a more complicated relationship with hyperactive-impulsive-attention problems. While both ADHD and CU traits are associated with early-onset CD, youth with early-onset CD who have high or low levels of CU traits do not differ in their rates of ADHD (Frick, 2006). ADHD might exacerbate the relationship between ODD and CU traits, and ADHD combined with ODD might have a multiplicative effect in the prediction of CU traits (Becker et al., 2013). While hyperactive-impulsive-attention problems and callous-unemotional traits might have overlap in their associated risk factors, course, and outcomes, their direct relationship with each other is not fully clear at this time.

### **Treatment Response across the Various Etiologies, Comorbidities and Associated Features of Disruptive Behavior Problems**

Given evidence that disruptive behavior issues emerge across different etiologies and comorbidities, and that the course of these problems differ, it follows that treatment response might differ as well. Studies on comorbidity and treatment outcomes have largely yielded mixed results. Youth with comorbid diagnoses tend to have more severe problems than youth with single, “pure” diagnoses (Nottelmann & Jensen, 1995). However, youth with comorbid issues might be just as responsive, or even more responsive, to treatment compared to youth with a single diagnosis. After controlling for initial severity, Doss and Weisz (2006) found that co-occurring syndrome effects on treatment gains were rare and modest, and were not significant obstacles to treatment success. Specific to disruptive behavior disorders, findings by Kazdin and Whitley (2006) suggest that youth with ODD who experienced greater change during treatment

began with a greater number of total symptoms (likely due in part to regression to the mean effects), and youth with at least two disorders in addition to a disruptive behavior disorder might show greater amounts of therapeutic change compared to youth with the same disruptive behavior disorder and one or no comorbid diagnosis, though outcome measures did not differ between the two groups at the end of treatment.

There is some evidence to suggest specific diagnostic profiles indicative of disruptive behavior might predict treatment outcomes. Early-onset conduct problems, often linked to an earlier diagnosis of ADHD, are considered persistent throughout childhood and are associated with poor adult outcomes (Beauchaine et al., 2010; Moffitt, 1993; Moffitt & Caspi, 2001). An investigation by Beauchaine, Webster-Stratton, and Reid (2005) suggests that youth who received conduct problem interventions that were above average on a measure of attention problems saw a greater reduction of observed behavioral problems when teacher training was included in the intervention process, suggesting that comorbid attention problems may alter the response to intervention for youth with disruptive behavior problems. A narrative overview by Ollendick, Jarrett, Grills-Taquechel, Hovey, and Wolff (2008) notes few studies have investigated ADHD comorbidity as a moderator of ODD and CD treatment outcome, and those studies that have done so show little or no difference in treatment response. It is noteworthy that most of these studies used dimensional measures of attention problems rather than a categorical diagnosis of ADHD, and these studies did not examine treatment response in usual care systems (Ollendick et al., 2008). Furthermore, only three studies specifically compared improvement on disruptive behavior between youth with symptoms of ADHD and youth without symptoms of ADHD (Costin & Chambers, 2007; Hartman, Stage, & Webster-Stratton, 2003; Webster-Stratton, Reid, & Hammond, 2001). Results in these studies may have been complicated by

insufficient power, regression to the mean given higher symptom severity of comorbid youth, artifacts of measures that include ADHD symptoms in externalizing problem severity, or low symptoms severity of hyperactive-impulsive-attention issues. It remains unclear whether ADHD influences response to treatment for disruptive behavior issues.

Disruptive behavior treatment might show different response and outcome among youth with disruptive behavior problems and comorbid depressive mood. In an investigation of treatment response for youth with early-onset conduct problems, Beauchaine et al. (2005) found that both maternally reported and behaviorally observed elevations of anxiety/depression symptoms were predictive of greater response to conduct problem treatment across a variety of parent, child, and teacher intervention programs. A recent study by Jarrett, Siddiqui, Lochman, and Qu (2014) examined depressive and anxiety symptoms separately, and found that elevated parent- and teacher-reported youth depression symptoms predicted greater reduction in externalizing behavior problems after a treatment intervention, suggesting that comorbid depressive symptoms specifically might predict greater reductions in externalizing behavior at the end of treatment. However, this study examined a sample of fourth grade students in the top 30% on a measure of aggressive behavior and their response to an abbreviated preventative intervention for aggressive children that focused on cognitive processes (Jarrett et al, 2014). Given this promising finding in response to an evidence-based aggression prevention intervention, symptoms of depressive mood might also predict improved response to disruptive behavior treatment for youth in usual care systems, though no research investigating this possibility was found in a literature review.

Research on treatment response and outcome for disruptive behavior problems across different diagnostic categories is limited, with most studies comparing individuals with pure and

comorbid disruptive behavior problems. While previous studies have investigated whether comorbid problems affect the treatment of disruptive behavior, they have frequently been performed in controlled settings, and might not translate to community mental health care settings. The presence of hyperactive-impulsive-attention problems and depressive mood problems might be associated with differences in response to disruptive behavior treatment, with depressive mood possibly associated with improved response and ADHD symptoms unclear in their influence on disruptive behavior treatment. There is no previous research in a usual care setting on the responsiveness to treatment of disruptive behavior problems when associated with depressive mood or hyperactive-impulsive-attention problems.

### **Current Study**

Using a standardized measure of treatment and treatment response, the current study examines intensive-in-home therapists' progress ratings on disruptive behavior problem (DBP) treatment targets (anger, aggression, and oppositional or non-compliant behavior), and seeks to determine whether a diagnosis of a depressive mood disorder or ADHD predicts differential rate of progress and/or better six month progress status on these treatment targets when compared to youth with a disruptive behavior disorder but no attention or depressive mood disorder. Comparisons in the rate and magnitude of progress between groups will be examined using multilevel modeling techniques.

Youth with a diagnosis of attention-deficit/hyperactivity disorder are expected to make slower progress and less total progress on these disruptive behavior targets after at most six months, compared to youth with a disruptive behavior disorder and no depressive mood or ADHD diagnosis. Youth with a depressive mood diagnosis are expected to make faster and

more progress after at most six months, compared to youth with a disruptive behavior disorder and no depressive mood or ADHD diagnosis.

## **Method**

### **Data Source**

A data-limited data set was electronically extracted from the Child and Adolescent Mental Health Management Information System (CAMHMIS) at the state of Hawai‘i’s Child and Adolescent Mental Health Division (CAMHD). Clinical documentation of all registered clients within the CAMHD system is recorded and stored in accordance with performance standards (CAMHD, 2012).

### **System of Care**

In Hawai‘i’s public mental health system of care, the most intensive services are provided by the Department of Health, Child and Adolescent Mental Health Division, or CAMHD. CAMHD contracts service providers to deliver therapeutic mental health interventions at multiple “levels of care.” Youth in the CAMHD system are placed within the least restrictive “level of care” that is medically necessary, with “higher” levels of care representing those that are more restrictive (e.g., hospitalization) and “lower” levels of care representing less restrictive interventions (CAMHD, 2012). The sample of youth examined by this study were limited to intensive in-home, the least restrictive level of care provided by CAMHD (lower levels of care are provided in other statewide systems, e.g. public schools). The reasons for the selection of this single level of care are threefold: (a) the IHH level of care is the most common placement of youth receiving services in the CAMHD system (Hill, Burgess, Hee, Jackson, & Nakamura, 2014); (b) IHH does not predetermine participants on the basis of their diagnosis or specific set of psychological issues; and (c) IHH does not prescribe specific practices or target(s) of therapy,



while some other levels of care are structured around specific therapist practices and treatment goals.

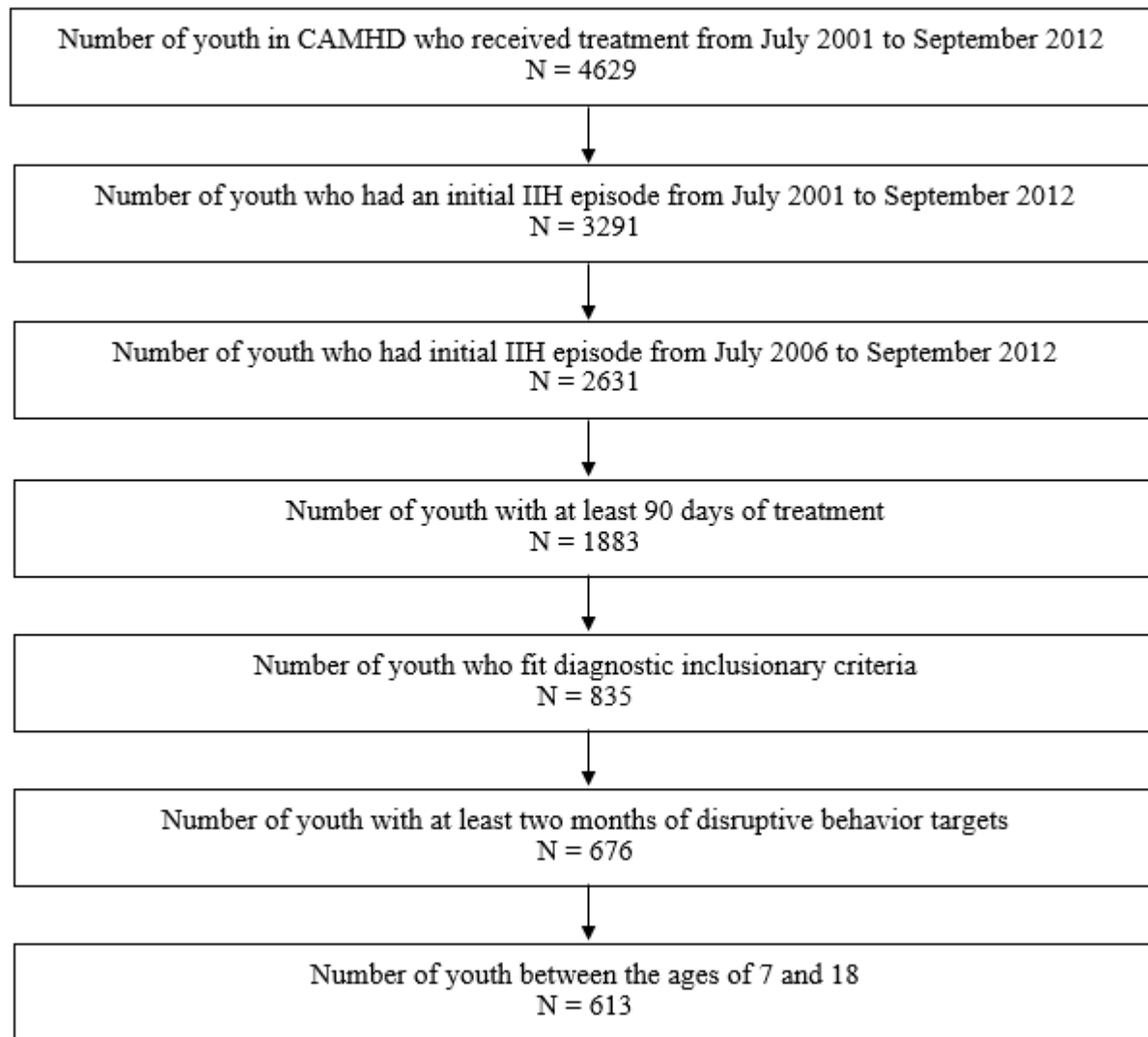
## **Participants**

**Youth Participants.** The six hundred and thirteen participants in the study (a) were between the ages of 7 and 18, (b) received services between July 1, 2006 and September 30, 2012, (c) completed at least 90 days of treatment at the IIH level of care, (d) had at least one of three disruptive behavior treatment targets (i.e., aggression, anger, oppositional or non-compliant behavior) endorsed for at least two reporting months within the first six months of treatment (study window), (e) did not carry a diagnosis related to psychosis, mania (including bipolar depression and mood disorder, NOS), post-traumatic stress, anxiety, mental retardation, borderline intellectual functioning, ADHD predominantly inattentive, or pervasive developmental disorder, and (f) met criteria for one of the following three diagnostic groups:

- 1) Attention group: Youth with a diagnosis of Attention-Deficit/Hyperactivity Disorder, Primarily Hyperactive/Impulsive or Combined Type (i.e., ADHD-PH or ADHD-C) and no depressive mood diagnosis. A disruptive behavior diagnosis is allowed but not required (final  $n = 193$ ).
- 2) Depressive mood group: Youth with a depressive mood diagnosis (i.e., Major Depressive Disorder; Dysthymia; Adjustment Disorder with Depressed Mood; or Depressive Mood Disorder, Not Otherwise Specified (NOS)) and no ADHD diagnosis. A disruptive behavior diagnosis is allowed but not required (final  $n = 164$ ).
- 3) Disruptive behavior group: Youth with a disruptive behavior disorder diagnosis (i.e., Conduct Disorder; Oppositional Defiant Disorder; Adjustment Disorder with Disturbance

of Conduct; or Disruptive Behavior Disorder, NOS); and no diagnoses in the above depressive mood or attention groups (final  $n = 256$ ).

The three disruptive behavior targets (anger, aggression, oppositional or non-compliant behavior) were selected as an aggregate measure of disruptive behavior problems (DBPs) for the following reasons: (1) a previously conducted factor analysis found these targets loaded together (Love, Orimoto, Powell, & Mueller, 2011); (2) in a study of treatment target progress ratings, these three targets showed a similar pattern in rate of progress over time and mean maximum level of progress reached (Love, Mueller, Tolman, & Powell, 2013); (3) the description of these targets in the codebook reflect some of the symptoms of disruptive behavior problems (i.e., oppositional defiant disorder and conduct disorder) as detailed in the *DSM-IV-TR* (CAMHD, 2008; American Psychiatric Association, 2000); (4) these three treatment targets have been coded together as part of a measure of disruptive behavior problems due to their relatedness to DSM-IV-TR symptom criteria in previous studies (Love et al., 2013; Love, Tolman, Mueller, & Powell, 2010); and (5) these three targets are among the most frequently indicated focuses of treatment within the intensive in-home level of care (Love et al., 2013; Milette-Winfrey, Mueller, Hee, & Runland, 2014). The treatment target willful misconduct was also considered, but was not included due to its different pattern in rate of progress over time and mean maximum level of progress reached (Love et al., 2013). Figure 1 provides more detailed information about the selection of youth based on inclusionary criteria at various cutoff points, which resulted in a final sample size of 613 youth. Table 1 provides the demographic information for youth included in this study broken down by each diagnostic category and by total sample.



*Figure 1.* Flow diagram of sample selection among youth receiving intensive in-home treatment from Child and Adolescent Mental Health Division.

A series of one-way analysis of variance (ANOVA) tests were conducted to evaluate the relationship between diagnostic groups on several continuous demographic variables examined within the MLM analyses. Significant differences between diagnostic groups were found on the youth variable of age ( $F(2, 610) = 36.62, p < .001$ ). A follow-up Tukey test indicated the mean age of the ADHD Group ( $M = 12.7, SD = 3.2$ ) was lower than the Mood ( $p < 0.001$ ) and DBD Groups ( $M = 14.8, SD = 2$  and  $M = 14.6, SD = 2.6$ , respectively,  $p < 0.001$ ).

A series of chi-squared analyses were performed to evaluate the relationship between diagnostic groups on some of the categorical demographic variables included within the MLM analyses below. Diagnostic group was found to be significantly related to gender ( $\chi^2 (2, n = 613) = 21.33, p < 0.001$ ). The proportion of males in the ADHD group, Mood group, and DBD group was 84.5%, 63.4%, and 73.0%, respectively.

Chi-squared analyses conducted on diagnostic groups by specific diagnoses resulted in a significant difference in rates of CD between diagnostic groups ( $\chi^2 (2, n = 613) = 27.31, p < 0.001$ ), with the proportion of youth with CD in the ADHD group, Mood group, and DBD group falling at 22.8%, 20.1%, and 41.0%, respectively. The rates of ODD also differed significantly between diagnostic groups ( $\chi^2 (2, n = 613) = 29.69, p < 0.001$ ), with the proportion of youth with ODD in the ADHD group, Mood group, and DBD group falling at 42.5%, 16.5%, and 36.7%.

Additionally, rates of substance use disorders, one of the few other psychiatric disorders that did not disqualify youth from inclusion in the study, differed significantly between the diagnostic groups ( $\chi^2 (2, n = 613) = 6.05, p < 0.05$ ). The proportion of youth with at least one substance use diagnosis in the ADHD group, Mood group, and DBD group was 18.1%, 24.4%, and 28.1%, respectively.

Due to the small  $n$  sizes of youth within some agency branches racial categories, no comparison was made for these variables. No other youth or treatment characteristics varied by diagnostic group.

Table 1.

*Youth demographic and clinical information broken down by diagnostic group and total sample size (n = 613)*

Variable	ADHD Group	Mood Group	DBD Group	Total Sample
Sample Size <sup>a</sup>	193 (31.5%)	164 (26.8%)	256 (41.8%)	613 (100%)
Age*	12.7 (3.2)	14.8 (2.1)	14.6 (2.6)	14.1 (2.8)
Gender (Male) <sup>a*</sup>	163 (84.5%)	104 (63.4%)	187 (73.0%)	454 (74.1%)
Length of IIH Episode (days)	276.4 (201.7)	256.7 (166.1)	257.5 (194.1)	263.2 (189.5)
Length of IIH Episode 180 or More Days <sup>a</sup>	116 (60.1%)	99 (60.3%)	147 (57.4%)	361 (59.1%)
Race <sup>a</sup>	--	--	--	--
American Indian or Alaska Native	0	0	0	0
Asian	13 (6.7%)	15 (9.1%)	22 (8.6%)	50 (8.2%)
Black	4 (2.1%)	1 (0.6%)	5 (2.0%)	10 (1.6%)
Multiracial	133 (68.9%)	103 (62.8%)	173 (67.6%)	409 (66.7%)
Native Hawaiian or Other Pacific Islander	17 (8.8%)	23 (14.0%)	25 (9.8%)	65 (10.6%)
White	19 (9.8%)	15 (9.1%)	23 (9.0%)	57 (9.3%)
Other	3 (1.6%)	1 (0.6%)	1 (0.4%)	5 (0.8%)
Not Available	4 (2.1%)	6 (3.7%)	7 (2.7%)	17 (2.8%)
CAFAS	91.3 (28.8)	88.8 (32.2)	92.5 (29.2)	91.1 (29.9)
Agency Branch <sup>a</sup>	--	--	--	--
Agency A	73 (37.8%)	71 (43.3%)	116 (45.3%)	260 (42.4%)
Agency B	24 (12.4%)	30 (18.3%)	50 (19.5%)	104 (17.0%)
Agency C	26 (13.5%)	14 (8.5%)	17 (6.6%)	57 (9.3%)
Agency D	17 (8.8%)	10 (6.1%)	30 (11.7%)	57 (9.3%)
Agency E	26 (13.5%)	14 (8.5%)	13 (5.1%)	53 (8.6%)
Agency F	7 (3.6%)	10 (6.1%)	13 (5.1%)	30 (4.9%)
Agency G	10 (5.2%)	8 (4.9%)	8 (3.1%)	26 (4.2%)
Agency H	6 (3.1%)	3 (1.8%)	3 (1.2%)	12 (2.0%)
Agency I	1 (0.5%)	3 (1.8%)	3 (1.2%)	7 (1.1%)
Agency J	2 (1.0%)	1 (0.6%)	1 (0.4%)	4 (0.7%)
Agency K	0	0	2 (0.8%)	2 (0.3%)
Diagnosis (Any) <sup>a</sup>	--	--	--	--
ADHD-C/ADHD-PH	193 (100.0%)	0	0	193 (31.5%)
Conduct Disorder*	44 (22.8%)	32 (19.8%)	106 (41.1%)	182 (29.7%)
ODD*	82 (42.5%)	27 (16.5%)	94 (36.7%)	203 (33.1%)
Other DBD (NOS, Adjustment)	23 (11.9%)	16 (9.8%)	59 (23.0%)	98 (16.0%)
MDD	0	55 (33.5%)	0	55 (9.0%)
Dysthymia	0	66 (40.2%)	0	66 (10.8%)
Other Mood (NOS, Adjustment)	0	50 (30.5%)	0	50 (8.2%)
Substance Use*	35 (18.1%)	40 (24.4%)	72 (28.1%)	147 (24.0%)
Other	20 (10.4%)	12 (7.3%)	22 (8.6%)	54 (8.8%)
Clinician Degree (Ph.D./Psy.D.)	13 (6.7%)	10 (6.1%)	9 (3.5%)	32 (5.2%)
Licensure (yes)	38 (19.7%)	26 (15.9%)	36 (14.1%)	100 (16.3%)
DBD Target Average Per Month	1.61 (0.56)	1.56 (0.61)	1.61 (0.60)	1.59 (0.59)

<sup>a</sup>Represents frequencies and percentages. All other variables represent means and standard deviations.

\*Represents significant between group differences on this variable.

**Therapist Participants.** Clinical data was provided by therapist ( $n = 172$ ) report on the MTPS. Since there were frequently multiple therapists working with the same youth participant, the therapist that most frequently completed the MTPS form (the person who actually filled out and submitted the form to CAMHD) for each youth was considered the lead therapist for that youth. In cases where multiple therapists were tied to one youth's MTPS forms and the therapists had the same number of MTPS forms completed, the initial therapist was chosen for analyses to examine therapist characteristic effects on DBP progress ratings. This decision was made because the length of the treatment episodes studied was limited to a maximum of the youth's first six months of treatment, and previous research suggests that youth typically see more rapid improvement earlier in treatment (Orimoto, Jackson, Keir, Ku, & Mueller, 2012), suggesting potential greater importance of therapist-patient interactions during the early stages of treatment. Relevant therapist data was examined including therapist's degree (i.e., Ph.D./Psy.D. vs. non-clinical doctoral degree) and licensure status. Two therapists were Master's level therapists for some clients and obtained doctorate level degrees before the treatment of other clients. One therapist was unlicensed for some clients and obtained licensure before the treatment of other clients. Therapist licensure and degree did not significantly vary by diagnostic group. Therapist information for the entire sample is provided in Table 2.

Table 2.

*Therapist information by total sample (N = 172)*

Variable	Total Sample
Number Of Degrees	1.0 (0.0)
Number of Clients	3.56 (3.48)
Highest Degree <sup>a</sup>	--
High School Diploma or GED	0
A.A/Vocational/Certificate	0
Bachelors (BS)	1 (0.6%)
Masters (MA, MS, MSW, MFT, APRN)	158 (91.9%)
Doctorate of Psychology (PsyD, PhD)	9 (5.2%)
Masters who obtained PhD/PsyD	2 (1.2%)
Education Doctor	1 (0.6%)
Juris Doctor	1 (0.6%)
Licensure <sup>a</sup>	--
Unlicensed	143 (83.1%)
Licensed	28 (16.3%)
Unlicensed who became Licensed	1 (0.6%)

*Note.* <sup>a</sup>Represents frequencies and percentages. All other variables represent means and standard deviations

## **Human Subjects Consideration**

Upon entry into the local system of care, youth clients and their legal guardian(s) received a complete description of CAMHD's Notice of Privacy and Disclosure Procedures. They then provided a written informed consent for the use of data for research purposes. Legal guardians are informed that they may revoke their consent at any time. Data on these clients, therapists, and service episodes are stored on password-protected computers as part of the CAMHD database. This study was submitted to the University of Hawai'i at Mānoa's Committee on Human Studies Institutional Review Board and received an exempt approval due to the nature of this study being archival and the signed informed consent for research purposes. This study meets the stated standards of the Health Insurance Portability and Accountability Act (HIPAA) and Family Educational Rights and Privacy Act (FERPA; CAMHD, 2012).

## **Measures**

### **Monthly Treatment Progress Summary (MTPS; CAMHD, 2005; Appendix A).**

Treatment targeting and progress rating data was collected from the Monthly Treatment Progress Summary, or MTPS (Daleiden, Lee, & Tolman, 2004). The MTPS is a clinician report form designed to measure service format and setting, problem areas targeted by the therapist in treatment ("treatment targets"), therapist practices utilized in treatment ("practice elements"), client progress on treatment targets, and client medication use. Each MTPS is completed on a monthly basis. If a youth receives treatment services from multiple therapists within a given MTPS month, the therapist that was most familiar with the youth, family, and services provided during the month is responsible for completing the MTPS, after consulting with the other therapist(s) (CAMHD, 2012). During the process of cleaning the MTPS data, 220 out of 4,724 (4.65%) MTPS entries were identified as having at least one additional MTPS filled out for the



same youth in that same month. None of these duplicate or triplicate MTPS entries contained identical MTPS data, and many were completed by different providers, suggesting that these multiple MTPS month entries reflected real clinical data. As such, these multiple MTPS entries were aggregated to preserve clinical data, with all endorsements of treatment targets and practice elements maintained and all progress ratings averaged.

Completion of the MTPS for each client has been mandatory for clinicians in the CAMHD system since July 1, 2006 in order to receive reimbursement (Nakamura, Daleiden, & Mueller, 2007). Due to this requirement, MTPS completion rates have been very high since then, suggesting that missing data is limited (Keir, Jackson, Izmirian, Mueller, & Sender, 2014). In the current study, only 37 MTPSs (1.1% of the total sample of 3408) were missing. Missing MTPSs were defined as an MTPS service month within the IIH episode that did not have an MTPS entry in the data set but did have a submitted MTPS in a following service month. Reasons for these missing MTPSs are unknown (e.g., therapist forgot to submit the MTPS, MTPS was rejected by the billing department and was not considered as an “accepted” record and possibly that there was no billable service that month).

Clinicians indicate up to 10 targets (from a list of 53 predefined targets and two blank “write-in” targets) that were the focus of treatment for that month and provide a subjective rating of progress for each individual target. Progress ratings are scored on a 7-point scale, ranging from 0 = <0% improvement (Deterioration) to 6 = 91-100% improvement (Complete Improvement), with higher numbers indicating greater improvement. When possible, progress ratings are to be informed by objective measures available to the therapist, such as assessments administered and behavioral observation data. Progress ratings are scored from an initial baseline, so that each monthly progress rating is scored relative to initial problem level for each

target behavior (CAMHD, 2008). Previous analyses established preliminary support for the validity of the MTPS with treatment targets associated with relevant primary diagnostic categories, a reasonable factor structure, and moderate temporal stability after one ( $k = .66$ ) and three ( $k = .52$ ) months of treatment (Daleiden et al., 2004; Love et al., 2011). MTPS treatment target progress ratings showed a significant relationship to change in functional status as measured by two standardized measures of clinical functioning and show temporal patterns of improvement that mirror other treatment outcome measures (Nakamura et al., 2007; Orimoto et al., 2012).

**Child and Adolescent Functional Assessment Scale (CAFAS; Hodges, 2000; Appendix C).** The CAFAS is a 200-item clinician report scale that assesses a youth's level of functional impairment. To complete the CAFAS, a clinician evaluates the child on behavioral descriptions of their impairment across eight domains of functioning: School Role Performance, Home Role Performance, Community Role Performance, Behavior Toward Others, Mood/Emotions, Mood/Self-Harmful Behavior, Substance Use, and Thinking. The therapist scores the child on their highest level of impairment (i.e., severe = 30, moderate = 20, mild = 10, no/minimal = 0) based on the specific items in each domain and impairment level, which is summed to calculate the youth's total CAFAS score (range = 0 to 240). CAMHD Care Coordinators complete this measure for all clients on a quarterly basis and enter their scores into the CAMHD data management system. For the purposes of this study, a client's baseline CAFAS score (i.e., the CAFAS that was closest in absolute value of days from the beginning of their IHH episode) was entered as a covariate in the study at the client-level. Mean CAFAS administration in the sample occurred 7.71 days ( $SD = 41.5$ ) after the start of treatment, with a range of 112 days before the treatment episode to 350 days after the treatment episode began. Twenty-four of

613 (3.9%) youth in the sample had their initial CAFAS over 90 days after the beginning of treatment, meaning that their CAFAS rating might not have reflected pre-treatment impairment.

The CAFAS has evidenced adequate internal consistency across items, adequate convergent validity with other related measures, and good inter-rater reliability (Hodges & Gust, 1995; Hodges & Wong, 1996). Concurrent validity studies have found that CAFAS scores are related to severity of diagnoses, intensity of care provided, living setting restrictiveness, juvenile justice involvement, social relationship difficulties, and school related problems (Hodges & Gust, 1995; Mueller et al., 2010; Nakamura et al., 2007).

**CAMHD diagnostic procedures.** Mental health evaluations are conducted by CAMHD staff or contracted providers, and are used for determining eligibility for services (CAMHD, 2012). Current DSM-IV-TR diagnoses on all five axes are included in a comprehensive evaluation that is further informed by developmental course, family history, school and social functioning, substance use, psychiatric and medical history, and previous interventions (CAMHD, 2012). Additional mental health assessments might be performed in unsuccessful treatment cases or to elucidate specific clinical questions (CAMHD, 2012).

## **Data Analysis**

**Data Preparation.** Response ranges for DBP progress ratings and CAFAS impairment were examined to identify impossible values or data entry errors. MTPS forms were inspected to ensure that each MTPS with any of the three disruptive behavior progress ratings endorsed also had the corresponding treatment target endorsed. The outcome variable of mean disruptive behavior progress rating was calculated for each MTPS form by aggregating the progress ratings of anger, aggression, and oppositional or non-compliant behavior for that month and examining it as a monthly average, forming the disruptive behavior problem (DBP) progress rating value.

This controls for the number of targets addressed per month, and is in line with previous longitudinal studies of children and adolescents within Hawai‘i’s public mental health system of care (e.g., Mueller et al., 2010; Orimoto, Mueller, Hayashi, & Nakamura, 2013). In this sample, 2,826 of the 3,406 (83.0%) MTPS entries had at least one disruptive behavior progress rating. In order to obtain a preliminary understanding of the data, total CAFAS and the dependent variable of DBP progress rating were examined for means, standard deviations, skewness, and kurtosis, and found to have normal distributions.

**Multilevel Modeling (MLM) Analyses.** MLM techniques were employed to analyze whether youth diagnosis predicted rate of improvement and final progress rating after six months of treatment in the IIH setting. Analyses followed guidelines discussed by Peugh (2010), which noted steps needed to conduct a MLM analysis. First, the appropriate parameter estimation methods and covariance structures needed to be selected (e.g., maximum likelihood or restricted estimation maximum likelihood). In maximum likelihood, regression coefficients and variance components are included in the likelihood function, which can lead to an overly liberal hypothesis test with a smaller sample size and/or more parameters (Heck, Thomas, & Tabata, 2013). In restricted estimation maximum likelihood, only variance components are included in the likelihood function, which tends to lead to better estimates when there are fewer groups in the study (Heck et al., 2013). Given that restricted estimation maximum likelihood can be used when only variance components are being compared, maximum likelihood was chosen for this model so that successive models with both regression coefficients and variance components could be compared.

Second, the ICC from the unconditional model (i.e., without predictors) was calculated to identify the proportion of variance explained by each level in the model (i.e., time, client, and

therapist; Heck et al., 2013). The ICC can also be interpreted as the within-subjects correlation of any two individuals at the same level (Quene & van den Bergh, 2004). In the current study, client-level differences needed to account for more than 5% of the between group variance in youth improvement rate to justify a multilevel, rather than a one-level analysis (Heck et al., 2013).

Third, the shapes of the within-subject growth trends were inspected among a randomly selected subset of the population ( $n=49$ , approximately 8%) to determine the overall shape of the trend (e.g., linear, quadratic, negative exponent, log, natural log). Relevant terms of time were considered for potential inclusion if growth rates were not linear (e.g., quadratic; Singer & Willet, 2003). Finally, certain variables such as age and total CAFAS were centered on their mean to maximize the interpretation of the data and the impact these variables had on the end of treatment progress rating (Heck et al., 2013).

The current study examined the extent to which psychiatric diagnoses predicted rate of change or slope of progress ratings for DBP treatment targets for youth exhibiting disruptive behaviors at the IIH level of care. The slope was calculated for each youth by examining the growth of their average DBP progress rating over time. SPSS was utilized to analyze the three-level mixed-effects model, where time as measured by MTPS month was nested within youth, which was nested within therapists. Level-one included linear and quadratic time in months and number of disruptive behavior targets endorsed as a covariate. Level-two included the main variable of interest (i.e., youth diagnosis) and controlled for between-client variation and youth-related variables. Level-three included therapist-level characteristics as covariates. The level-two youth variables examined included age, ethnicity, gender, impairment as measured by CAFAS closest to the start of treatment, ODD diagnosis, CD diagnosis, substance use diagnosis,

treatment duration, and IHH agency branch. The level-three predictors examined were therapist licensure and therapist degree, specifically examining whether doctorate. therapists significantly predict the intercept compared to non-doctorate therapists.

Below is the equation that represents the multilevel model for the current study. The subscripts of  $t$ ,  $i$ , and  $j$  represent time, youth, and therapists, respectively, while  $x$  represents the number of predictors at each level:

$$\text{Level-one: } Y_{tij} = \pi_{0ij} + \pi_{1ij}\text{TIME}_{tij} + \pi_{2ij}(-1)\text{TIME}_{tij}^2 + \pi_{3ij}\text{DBPTargets}_{tij} + e_{tij}$$

$$\text{Level-two: } \pi_{0ij} = \beta_{00j} + \beta_{01j}\text{ADHDvsDBD}_{1ij} + \beta_{02j}\text{MoodvsDBD}_{2ij} + \dots \beta_{0xj}\text{CAFAS}_{xij} + r_{0ij}$$

$$\pi_{1ij} = \beta_{10j} + \beta_{11j}\text{ADHDvsDBD}_{1ij} + \beta_{12j}\text{MoodvsDBD}_{2ij}$$

$$\pi_{2ij} = \beta_{20j} + \beta_{21j}\text{ADHDvsDBD}_{1ij} + \beta_{22j}\text{MoodvsDBD}_{2ij}$$

$$\pi_{3ij} = \beta_{30j}$$

$$\text{Level-three: } \beta_{00j} = \gamma_{000} + \gamma_{001}\text{Licensure}_{1j} + \gamma_{002}\text{Degree} + u_{00j}$$

$$\beta_{01j} = \gamma_{010}$$

$$\beta_{02j} = \gamma_{020}$$

$$\beta_{1pj} = \gamma_{1p0}$$

$$\beta_{2pj} = \gamma_{2p0}$$

$$\beta_{30j} = \gamma_{300}$$

**Power analysis.** Multilevel models are impacted by factors across each level, including sample size, fixed versus random effects, cross-level interactions, and residual variances, and thus do not readily lend themselves to power analysis calculations. There are limited resources available for researchers attempting to analyze statistical power for a three-level multilevel model analysis. Previous studies within the same usual care system reported significant findings when examining youth rates of improvement on functional impairment predicted by characteristics including diagnoses ( $N=165$ ; Mueller et al., 2010), and when examining youth rates of improvement on disruptive behavior disorders predicted by the use of practice elements ( $N=720$ ; Orimoto, 2014). It was therefore expected that the current study's sample of 613 youth was substantial enough to detect significant effects of youth diagnoses on disruptive behavior treatment target progress ratings. Multiple data points across six months also allowed for a detailed examination of the pattern of youth treatment target progress across diagnostic groups, increasing the power to determine change (Willett, 1989).

## **Results**

### **Data Preparation and Missing Values**

Response ranges for each DBP progress rating and total CAFAS were calculated, and no impossible values were found in the dataset. MLM allows for incomplete or unequal amounts of data for each participant (Quene & van den Bergh, 2004), making it unnecessary for listwise deletion to occur if participants had missing data or unequal time points. However, MLM assumes that the missing data in the sample are missing at random (Quene & van den Bergh, 2004), so a Missing Values Analysis was run in IBM SPSS Statistics Version 20 to determine if the data were Missing Completely At Random, Missing at Random, or Missing Not at Random (Little & Rubin, 1987).

As mentioned previously, 37 MTPSs (1.1% of the total 3408 MTPSs) were defined as “missing” (i.e., a month in which an MTPS was not completed that was followed by a month in which an MTPS was completed, implying a missing MTPS month). In the current study, only Total CAFAS Score was investigated for missing data. With this variable, either the data were completely present or completely missing for each client. Thus, the Missing Values Analysis for this variable was not found to be Missing Completely at Random, with CAFAS Total Score data missing for two out of the 613 youth in the sample. To address this missing data, a multiple imputation was used to calculate a CAFAS value using relevant variables that occurred in the same level (i.e., level-two) as the CAFAS Total Score. Missing MTPS data was not imputed because only approximately 1% of MTPS data was considered missing, and MLM allows for participants to have unequal amounts of data.

Before conducting an MLM, a preliminary step is often to partition the variance in the outcome into the proportion present at each level (i.e., calculating the ICC). For longitudinal models like the one in this study, it is typically recommended to use an unconditional growth model that includes a variable for time in the null model (Heck et al., 2013). After entering time into the model and calculating the variance components, the total variance estimate of the model was 1.77 (level-one variance of 1.20 + level-two variance of 0.13 + level-three variance of 0.44). It was estimated that level-one (i.e., time) would account for 67.80% (i.e.,  $1.20/1.77$ ) of the variance, level-two (i.e., client-level variables) would account for 7.34% (i.e.,  $0.13/1.77$ ) of the variance, and level-three (i.e., therapist-level variables) would account for 24.86% (i.e.,  $0.44/1.77$ ) of the variance in the MLM analysis. Since the main variable of interest was on level-two, it was necessary that at least approximately 5% of the variance be at this level in order to conduct an MLM analysis that included this level. With approximately 7.34% of the variance



located between clients at level-two, conducting a MLM was determined to be appropriate for this sample.

A consistent trend in the shape of the growth curves of these cases did not emerge upon inspection of the random sample of 49 youth, with multiple varieties of growth shapes observed (e.g., linear, quadratic, natural log, inverted “U,” etc.). Given that a consistent pattern for the overall shape of the growth trend was not observed from this random subsample, mean progress ratings for each DBP target were calculated and examined, and it was determined that the growth curve for anger, aggression, and oppositional or non-compliant behavior appeared to be quadratic in nature, with more rapid increases early in treatment and smaller increases in later months. A null model was run with both linear and quadratic time polynomials as fixed effects. Quadratic time was found to be a significant fixed effect ( $F(1, 2022.39) = 27.463, p < .001$ ), resulting in the retention of time in both linear and quadratic forms in the model (Heck, 2013).

The intercept was also defined as ending status (i.e., the predicted level of the dependent variable at the end of the study, adjusted for covariates in the model). By recording the time variable in this manner, the intercept could be interpreted as each youth’s final average improvement rating on MTPS DBP treatment targets after at most six months of treatment (which ranged from month 3 to month 6, depending on the total length of treatment for each client in the sample). To define the intercept as ending status, the time variable was coded such that the last month of treatment for each youth was 0, with previous months coded consecutively as negative numbers in increments of -0.2 (up to -1 for six month episodes), to indicate that it occurred prior in time to the last month of treatment. Due to this design of intercept as ending status, the value assigned to the first month of treatment for each youth varied, with youth receiving six months of treatment coded between -1 (at first month) and 0 (at end of treatment),

and youth receiving three months of treatment coded between -0.4 (at first month) and 0 (at end of treatment). Additionally, given the intention to define intercept as ending status after at most 6 months of treatment, as well as the quadratic growth curve of progress ratings that shows more rapid increases early in treatment that then diminish over time, quadratic time was coded negatively, such that linear time was squared and then multiplied by negative one, maintaining the structure of time as coded between -1 and 0. See Table 3 for an example of how time was recoded for two clients who had three months and six months of treatment.

Table 3.

*Example of how time was coded to be the “end status” for clients with different treatment episode lengths*

Client Random ID Number	Time (in Months)	Recoded Linear Time Variable	Recoded Quadratic Time Variable
1	1	-0.4	-0.16
1	2	-0.2	-0.04
1	3	0	0
2	1	-1	-1
2	2	-0.8	-0.64
2	3	-0.6	-0.36
2	4	-0.4	-0.16
2	5	-0.2	-0.04
2	6	0	0

**Time-only model.** This model considered only the intercept and time within clients, with the time variables added as a fixed effect. Random effects included in the coefficients associated with time were attempted at level-two and –three, but did not satisfy convergence criteria for the model, so time was maintained as a fixed effect in the model (Hayashi, personal communication May 2016). Several possible level-one error structures were preliminarily investigated by comparing Akaike information criterion (AIC) estimates, with lower AIC values indicating a better fit of the covariance structure to the data. Although the heterogeneous autoregressive covariance structure (ARH1) provided the best fit as indicated by the lowest AIC value, the homogeneous autoregressive structure (AR1), which had the second lowest AIC, was selected as a reasonable compromise between an identity covariance structure and the more fully specified covariance structure presented by ARH1 (Heck et al., 2013). The end status intercept of this model was 3.08 ( $p < 0.001$ ), suggesting that at the final month of their treatment episode or after six months of treatment, participants’ final average progress rating on DBP treatment targets was 3.08 on a 7-point zero to six scale. The estimate for quadratic time was 1.08 ( $p < 0.001$ ), while

the estimate for linear time was  $-0.04$  ( $p = .89$ ), suggesting that across the varied lengths of their treatment episodes, the mean progress rating on DBP treatment targets increased by an average of 1.04 ( $1.08 - 0.04$ ) on the MTPS rating scale, indicating an average change from “minimal improvement (11%-30%)” at month one to “some improvement (31%-50%)” at month 6. Although linear time did not significantly predict the intercept, it was maintained in the model due to the significance of quadratic time. When investigating the variance parameters of this model, there was significant variability in the intercept within youth (Wald  $Z = 19.31$ ,  $p < 0.001$ ), between youth (Wald  $Z = 2.25$ ,  $p < 0.05$ ), and between therapists (Wald  $Z = 5.70$ ,  $p < 0.001$ ). The -2 Log Likelihood deviance value for the final time-only model was 8501.73.

**Level-one model.** The next step of model development was to add time-varying (within-youth) covariates to explain variance in the intercept. In addition to the time variable from the time-only model, the covariate of the sum of DBP targets endorsed per month (centered on the minimum) was added into the model as a fixed effect for explaining the level-one intercept. A higher number of DBP targets endorsed in a given month was significant at predicting lower average progress ratings that month. With every added DBP treatment target endorsed beyond the first in a given month, the average progress rating on DBP treatment targets for that month decreased by an average of 0.09 points on the MTPS ( $p < 0.02$ ). The -2 Log Likelihood deviance value for the final time-only model was 8495.51. The difference in deviance between two nested models is distributed as a chi-squared analysis, with degrees of freedom equal to the difference in the number of parameters. Comparing the level-one model to the time-only model, the parameter difference of 1 (parameter difference  $df = 8 - 7 = 1$ ) calls for a difference between deviance values between the two models above the chi-square critical value of 3.84 in order to be considered significantly improved over the previous model. As the deviance difference of 6.22 is greater

than the chi-square critical value of 3.84, the level-one model can be considered significantly improved over the previous model, suggesting that this level-one model was better at predicting average DBP progress ratings.

**Level-two model.** The next step of the model development was to add between-youth fixed predictors to further explain variance in the intercept. In addition to the time variables and DBP targets per month variable from the level-one model, the following variables were added into the model as fixed effects for explaining the level-two ending status intercept: diagnostic group (ADHD, Mood, and DBD, with the comparison group being youth in the DBD group), gender, age in years (centered on the grand mean), race (with the comparison group being multiracial youth due to it having the largest sample size), total CAFAS score nearest to the start of treatment episode (centered on the grand mean), CD diagnosis, ODD diagnosis, substance use diagnosis, agency branch (with the comparison group being Agency A due to it having the largest sample size), and length of treatment (coded as 1 for youth with 180 or more days of treatment, 0 for youth under 180 days).

Theory or previous research can be used to limit the variables added to the slope model because too many variables can make the results difficult to interpret. Thus, due to the focus of the current study of determining whether diagnostic group has an effect on the slope of progress ratings for DBP treatment targets, only diagnostic group was included as a fixed effect interaction with linear and quadratic time for the level-two slope model. No covariates were entered as random effects due to the lack of theoretical support to consider these variables as randomly varying.

For the ending status intercept model, gender, agency, CD diagnosis, ODD diagnosis, and race were not significant predictors of the intercept and were removed from the final level-two

model. The final level-two model for the intercept included the following significant variables: quadratic time, sum of DBP targets per month, CAFAS total, age in years, substance use diagnosis, and length of treatment. Diagnostic group was not a significant predictor of the intercept, but was maintained in the model due to the focus of the current study on diagnostic group as a predictor variable and due it approaching significance ( $p < 0.10$ ). These factors and covariates together changed the intercept to be 2.94 ( $p < 0.001$ ), which meant that the final average progress rating on DBP treatment targets was 2.94 for youth in the sample that were in the DBD diagnostic group, had less than 180 days of treatment, had only one DBP target endorsed on that last MTPS, were the average age in the sample, did not have a substance use disorder diagnosis, and had the average level of CAFAS impairment for the sample.

Individual predictors of the intercept that were significant at predicting higher final average progress ratings included lower CAFAS impairment, higher age, treatment length of 180 days or more, the absence of a substance use disorder, as well as fewer DBP targets per month. For youth who received 180 days or more of treatment, the final average progress rating on DBP targets increased by 0.26 points on the MTPS ( $p < 0.001$ ). For youth that were one year older than the mean age of 14.1 years old, the final progress rating on DBP targets increased by 0.05 ( $p = 0.001$ ). For every 10 points lower a youth was rated on the CAFAS than the sample mean of 91.1, the final progress rating on DBP targets increased by 0.04 ( $p < 0.001$ ). For youth who had a substance use diagnosis, the final average progress rating on DBP targets decreased by 0.17 ( $p < 0.05$ ). Finally, for every additional DBP target endorsed in a month, the progress rating on DBP targets decreased by 0.08 ( $p < 0.05$ ).

In the final level-two model, diagnostic group approached significance at predicting different final progress ratings on DBP progress ratings ( $p < 0.10$ ). The mood group trended

towards lower final progress ratings than the DBD group, and the ADHD group trended towards higher final progress ratings than the DBD group. When examining the time slope model, diagnostic groups were not significant at predicting the slope of improvement on the average progress rating for DBP targets on measures of both linear and quadratic time interactions.

The deviance value for the final level-two model (-2 Log Likelihood = 8448.78) was smaller than the previous model (-2 Log Likelihood = 8495.51). The difference between the deviance values for these two models needed to be above the chi-square critical value of 18.31 (parameter difference  $df = 18 - 8 = 10$ ) in order to be considered a significant improvement over the previous level-one model. With the deviance difference of 46.73 being greater than the chi-square critical value of 18.31, the current model was significantly improved over the previous model, suggesting that the final level-two model was better at predicting end status and slope of average DBP progress ratings.

**Level-three model.** The third step of the model development included adding between-therapist fixed predictors to further explain variance in the intercept. In addition to carrying over the time variable from the time-only model, and significant predictors at both level-one and level-two in the model, therapist degree (coded as doctorate. compared to non-doctorate) and licensure (i.e., licensed or unlicensed) were added into the model as fixed effects for the level-three intercept model. None of these level-three variables were found to be a significant predictor of the ending status intercept, and so were not included in the final model. This resulted in the final model for this study including predictors at only level-one and level-two. However, the variance components were still estimated for the therapist level, since it was appropriate to consider the covariates at level-one and level-two as nested within therapists, even without significant covariates at that level. The full results of this MLM can be seen in Table 4.

Table 4.

*Multilevel Models Predicting DBP Progress Ratings (N=613)*

		Level-One Model	Level-Two Model
<i>Fixed effects</i>			
Final average progress rating	Intercept	3.08** (SE = 0.08)	2.94** (SE = 0.11)
	DBP Targets Per Month (CM)	-0.09* (SE = 0.04)	-0.08* (SE = 0.04)
	ADHD Group vs. DBD Group		0.20 (SE = 0.12)
	Mood Group vs. DBD Group		-0.10 (SE = 0.13)
	Age in Years (GMC)		0.06** (SE = 0.01)
	CAFAS Total per 10 points (GMC)		-0.04** (SE = 0.01)
	Length of Treatment (<180 Days)		0.26** (SE = 0.07)
	Substance Use Diagnosis		-0.17* (SE = 0.08)
	Time (Linear)	-0.04 (SE = 0.21)	0.03 (SE = 0.32)
	Time (Quadratic)	1.08* (SE = 0.21)	0.82* (SE = 0.32)
Rate of Change	ADHD Group vs. DBD Group (Linear)		0.11 (SE = 0.49)
	Mood Group vs. DBD Group (Linear)		-0.58 (SE = 0.52)
	ADHD Group vs. DBD Group (Quadratic)		0.26 (SE = 0.48)
	Mood Group vs. DBD Group (Quadratic)		0.92~ (SE = 0.52)
<i>Variance Components</i>			
Level-1 (Time)	Within-person	1.21**	1.21**
Level-2 (Client)	In final status	0.11*	0.07
Level-3 (Therapist)	In final status	0.45**	0.45**
<i>Goodness of fit</i>	Deviance	8495.51	8448.78
	No of estimated parameters	8	18
	AIC	8511.51	8484.78
	BIC	8559.09	8591.82

*Note.* GMC = grand-mean centered. CM = centered on the minimum. AIC = Akaike information criterion. BIC = Bayesian information criterion. PDEB = practices derived from the evidence-base. PMES = practices with minimal evidence support. ~p<0.10; \*p<0.05; \*\* p < 0.001



## **Follow-Up Analyses**

Given that the dependent variable of DBP progress rating represents a monthly average of up to three possible DBP treatment target progress ratings, additional exploratory analyses were conducted by entering each DBP progress rating (i.e., anger, aggression, oppositional or non-compliant behavior) separately into a level-two model of the MLM (with time at level-one, and no additional variables at level-two or –three) to see whether youth diagnostic group might be significant at predicting the end status and/or rate of change for the progress ratings of individual DBP progress ratings. Diagnostic group was not significant at predicting end status or rate of change for any of the three individual DBP progress ratings when entered as the sole covariate in these level-two models, with youth in the ADHD group trending towards higher DBP progress ratings, and youth in the depressive mood group trending towards lower DBP progress ratings.

Each factor and covariate included in the final level-two model was entered into separate multilevel models as a solitary predictor variable to determine whether these factors and covariates are individual significant predictors of the end status on average DBP progress rating. Higher youth age, length of treatment 180 days or longer, fewer DBP targets per month, and lower total CAFAS remained significant predictors of higher end status average DBP progress rating as a sole predictor variables in these MLM analyses, while substance use disorder did not individually predict the end status of DBP progress ratings.

In order to better understand the significant predictive power of the number of DBP targets endorsed per month predicting lower monthly progress ratings, additional exploratory analyses were conducted by entering each individual DBP target (i.e., anger, aggression, oppositional or non-compliant behavior) separately into a level-one model of the MLM (with

time at level-one, and no variables at level-two or –three) to determine whether any of these three disruptive behavior targets’ endorsement significantly predicted the average progress rating of DBP targets. Anger and aggression did not significantly predict average DBP progress rating, while oppositional or non-compliant behavior trended ( $p = 0.062$ ) towards predicting lower progress rating. Though all three targets were not significant in predicting average DBP progress ratings, all three targets’ endorsement trended towards predicting lower progress ratings.

Due to the finding that number of DBP targets endorsed significantly predicted DBP progress ratings at level-one (between time) of the MLM, exploratory analyses were also conducted in which the total number of DBP target endorsements per case (ranging from 2 to 18) and the total number of unique individual DBP targets endorsed per case (ranging from 1 to 3) were entered separately into a level-two model of the MLM (with time at level-one and no other variables at level-two or –three) to determine whether these level-two (between client) covariates significantly predicted the end status for the average progress rating of DBP targets. Both the total number of DBP targets per case and the total number of unique DBP targets endorsed per case were not significant at predicting end status of average DBP progress rating.

## **Discussion**

The primary aim of this study was to determine whether and to what extent diagnoses predicted improvement rates and total improvement after, at most, six months of treatment for youth in the IIH setting on DBP progress ratings. The hypothesis that a diagnosis of depressed mood would predict faster and more DBP progress, and that a diagnosis of ADHD would predict slower and less DBP progress, was not supported based on initial or subsequent exploratory analyses. Diagnostic groups approached significance ( $p > 0.10$ ) in predicting the end state of treatment, with a trend towards less progress by end status for youth with depressed mood, and

more progress by end status for youth with ADHD, when compared to youth without either of these disorders. Furthermore, higher age, longer length of treatment, lower number of DBP treatment targets endorsed per month, the absence of a substance use disorder, and lower total CAFAS impairment scores nearest to episode start significantly predicted higher final average progress rating on DBP treatment targets, and subsequent analyses indicated that all of these predictors except for substance use disorder remained significant when entered as individual covariates in MLM analyses.

The major finding of this study was that diagnostic groups (ADHD, depressive mood, disruptive behavior) approached significance at predicting final average progress rating but in the *opposite* direction expected. Youth with depressed mood showed a trend towards smaller final average progress rating than youth with a DBD. This finding contradicts prior findings of Beauchaine et al. (2005) and Jarrett et al. (2014) that suggested elevated symptoms of youth depression predicted greater improvement on externalizing behavior problems after treatment. Youth with ADHD showed a trend towards larger final average progress ratings for DBP targets compared to youth with just a DBD, which was not in line with the hypothesis of this study that ADHD would predict worse disruptive behavior treatment outcomes due to its neurodevelopmental nature and association with more negative sequelae when comorbid with disruptive behavior. Due to a lack of significant results, the null hypothesis cannot be rejected. However, with results approaching significance in the opposite direction of the study's hypotheses, and specifically in the opposite direction of previous research that suggested depressive mood might lead to a greater response to disruptive behavior treatment, it is worth discussing possible reasons that the non-significant results of the current study trended against expectations.

When considering the trend of the ADHD group towards higher progress ratings, it is important to consider the impact of age. Analyses with only diagnostic groups as a predictor suggest that the ADHD group does not notably differ from the DBD group in DBP progress rating at the intercept. However, the depressive mood group does still demonstrate a non-significant trend in the direction of lower progress ratings than both the ADHD and DBD groups. Lower age as a predictor variable independently predicts lower progress ratings, and so it appears that the inclusion of both age and diagnostic groups in the final model results in the trend of the ADHD group towards higher progress ratings. This result suggests that youth with ADHD may trend towards a more positive disruptive behavior treatment response than youth without ADHD, despite its neurodevelopmental nature and association with more severe conduct problems later in life. Youth with ADHD and disruptive behavior might find treatment services more reinforcing and the positive attention it provides more appetitive due to the increased social impairment and/or emotional dysregulation associated with impulsivity. However, this finding also suggests that youth with ADHD and disruptive behavior concerns are referred to treatment earlier than youth with only a disruptive behavior disorder diagnosis, and their lower age of referral might be associated with other barriers to disruptive behavior treatment, despite the possibility that the presence compared to the absence of ADHD might be associated with improved treatment response. Younger youth with a DBD diagnosis and without ADHD might be particularly unresponsive to disruptive behavior treatment, with the possibility that these youth might display more callous unemotional traits as their reason for early referral to public mental health, which could be particularly resistant to therapeutic effects.

One possible reason for the findings that youth with depressive mood trend towards lower progress ratings at the intercept is that youth receiving IHH care do not receive a

standardized treatment program, instead receiving services that vary according to client needs, therapist theoretical orientation, and the varying weekly needs in treatment. This idiographic approach might result in youth with depressed mood problems receiving less focus and time on DBP treatment (due to more focus on depressed mood treatment) than ADHD and DBD youth that exhibit more “pure” disruptive behavior concerns. Supporting this possibility, Winfree (2016) found that youth with both internalizing and externalizing diagnoses received fewer targets for externalizing problems than did youth with only an externalizing diagnosis. Similarly, depressive mood youth in IIH might receive fewer practices that are supported by the evidence base as effective DBP treatment compared to youth with more “pure” disruptive behavior problems in the ADHD and DBD groups, due to potentially less focus by therapists on externalizing treatment methods. For example, youth in the mood group might have received treatment targeting “anger” and “aggression” that utilized practices designed to treat depressed mood rather than disruptive behavior problems, due to these symptoms potentially being interpreted by the therapist as a manifestation of the mood disorder rather than disruptive behavior problems in their own right. Previous research found that higher therapist education was associated with better outcome for child internalizing problems, but not child externalizing problems (Weisz et al., 1995), and the predominantly Master’s level therapists at the IIH level might be less proficient at delivering potentially more difficult cognitive treatment for youth with depressive mood problems than they are at delivering more straightforward behavioral interventions for purely externalizing youth.

Significant predictors in final average progress rating on DBP targets included age, treatment episode length, CAFAS rating, substance use diagnosis, and number of DBP targets per month. Younger youth might have achieved lower final average DBP progress ratings than

older youth due to a potentially higher rate of the early-onset and persistent form of disruptive behavior that is thought to be more difficult to treat (e.g., Beauchaine et al., 2010; Loeber & Hay, 1997). Referral rate differences by age might also play a role. Youth referred to CAMHD services before adolescence might be exhibiting particularly acute disruptive behavior problems compared to older youth, who might qualify for services for additional concerns seen at lower rates in younger youth (e.g., legal difficulties, depressive mood, truancy). This increased severity might not be accounted for by total CAFAS score due to CAFAS subscales that do not account solely for disruptive behavior impairment. Subsequent Pearson correlation analyses suggested that the Substance Use and Community subscales show strong positive correlations with age, while the Behavior Toward Others subscale shows a strong negative correlation with age, supporting the possibility that younger youth in the sample demonstrated more severe disruptive behavior problems in particular.

Longer treatment episode length was also a significant predictor of final average progress rating on DBP targets. Youth who received less than 180 days of treatment likely received fewer elements of the treatment service than did youth with at least 180 days of treatment, allowing them less time to learn skills in treatment and therefore less time to demonstrate treatment response. The intercept in the model was set dynamically for each youth, so that youth with only 3 months of treatment had their intercept set to month three of treatment, while youth with 6 months of treatment had their intercept set to month six of treatment. Youth with less than 6 MTPSs therefore had a shorter observed treatment length in the study, and so had less time to demonstrate improvement than did youth with at least 180 days. Youth receiving less than 180 days of treatment might also have ended services early due to factors that might act as a barrier

to treatment response (e.g., low motivation, low family engagement, socioeconomic barriers to attend sessions).

Higher CAFAS total score was a significant predictor of lower final average progress rating on DBP targets. It is likely that more highly impaired youth are less responsive to treatment interventions due to their higher impairment, which reflects greater case complexity. Another possible explanation for this finding is the design of MTPS progress ratings as a change from each individual's baseline. Whereas another measurement of a youth's symptoms of psychopathology might show greater regression to the mean in severely impaired youth, MTPS progress ratings as a measure from each youth's baseline might not be as susceptible to regression effects and might instead be more like measures of clinical status at end of treatment (e.g. whether client continues to carry a specific diagnosis). As a measure of impairment across multiple domains, youth with a higher CAFAS total score might also have presented with more needs in treatment, resulting in less focus specifically targeted towards disruptive behavior. It is worth noting that the range of CAFAS completion relative to treatment start varied considerably in the sample, with a small number of youth (3.9%) receiving their CAFAS score more than 90 days after treatment had begun (i.e., past the 3 month window of the CAFAS impairment). However, CAFAS remained a significant predictor in subsequent analyses with these youth removed from the sample.

Substance use disorders also predicted lower DBP progress ratings after at most six months of treatment. The presence of a comorbid substance use disorder might have resulted in less focus on disruptive behavior problems in treatment, and the very presence of substance use problems might act as a barrier to treatment response. Orimoto, Higa-McMillan, Mueller, & Daleiden (2012) found that youth with substance use disorders tended to receive fewer behavior

management and family intervention practices, which might have resulted in lower progress on disruptive behavior targets. Youth substance use might also have acted as a client barrier to treatment engagement and response, with youth who engage in substance use showing less motivation to change their disruptive behavior. Notably, substance use disorder did not independently predict DBP progress ratings, suggesting this significant effect might be due to the interplay between substance use and other variables in the final model.

An increased number of DBP targets in a given month significantly predicted lower DBP progress ratings for that month; however, this significant result did not extend to measures of DBP target endorsement total by case (i.e., client-level rather than time-level) or as an endorsement of unique DBP targets per case (e.g., a sum of whether a youth ever received an endorsement of the anger, aggression, and oppositional or non-compliant behavior targets during their treatment episode). This finding might be due to therapists endorsing more DBP targets during months in which disruptive behavior is particularly problematic, with more focus on these problems when youth are “off the rails,” leading to a lower rating of progress given the increased severity of DBP presentation that month. The possibility that specific individual DBP targets are driving this significant finding was assessed by examining each individual DBP target as a predictor of average DBP progress rating intercept. The targets anger and aggression did not significantly predict the intercept, while oppositional or non-compliant behavior approached significance ( $p < 0.10$ ) in predicting a lower intercept for average DBP progress rating. Oppositional or non-compliant behavior was the most commonly endorsed DBP target ( $n = 2022$ , compared to  $n = 1567$  for anger and  $n = 1088$  for aggression), and it is possible this target approached significance due to its higher rate of endorsement and it carrying the lowest associated mean progress rating in the sample (2.75, compared to 2.94 for aggression and 2.76



for anger). The endorsement of any of the three individual DBP targets showed a non-significant trend toward lower mean DBP progress rating, suggesting that the significant finding for DBP targets per month was not due solely to the influence of one specific DBP treatment target.

There are several issues that might limit interpretation of these findings. The diagnostic process within the CAMHD system is not standardized, with both CAMHD and multiple contracted outside parties providing diagnostic assessment (CAMHD, 2012), which potentially resulted in heterogeneous diagnostic groups that are not stringently reflective of their respective DSM-IV-TR diagnostic criteria. In addition, diagnoses do not perfectly reflect developmental psychopathology, due to sub-threshold symptoms and other potential challenges, and so the categorical examination of these problem areas might not have fully captured their influence on treatment response.

MTPS data are taken on a monthly basis, and the presence or absence of endorsement on a particular target does not necessarily reflect the amount of time or focus that each target received over the course of that month. For example, one youth who received *anger* as a focus of treatment on an MTPS might have received a few brief minutes focused on that target, while another youth might have received treatment on that target for the majority of multiple sessions that month. While the final model analysis included a measurement of treatment episode length that could account for some of the influence of treatment quantity, it did not account for the quantity of treatment within a given month (e.g., number of treatment minutes or treatment episodes). As previously addressed, the study did not examine practice element information available on the MTPS, which might have differed between diagnostic groups due to therapist conceptualization of DBPs (e.g., depressed mood as “acting out” depression, ADHD as a

neurobiologically driven presentation of disruptive behavior) or potential organizational or theoretical orientation differences.

The accuracy of therapist report is another limitation of the study. Self-report measures are at risk of reporter bias, and as a measure of therapist activity and progress in treatment, therapists might be prone to endorsing targets that were not a major focus in treatment and selecting higher progress in order to create the perception that they are effective therapists. Previous research has suggested therapist self-report and observation of therapist behavior can be inconsistent (e.g., Hurlburt, Garland, Nguyen, & Brookman-Frazee, 2010). There were few therapist-related variables included in the study, and results might have been improved if other relevant therapist-level variables were available for examination (e.g., therapist race, therapist gender, theoretical orientation, IHH experience, etc.). Therapist information in the study was examined such that only the therapist who completed the MTPS most frequently was included in the analysis, even though many youth worked with more than one therapist. Therefore, this study might have been limited in examining the impact of therapist-level variables.

The lack of significant findings for youth diagnosis might have been influenced by low variance at the client-level in the MLM analyses, with only 7.34% of variance in the model accounted for at the client level (level-two) in the initial time-varying model. Due to this low initial variance at the client level, it might have been more difficult to determine whether client-level variables are statistically significant predictors of progress. However, given the trend of these non-significant results in the opposite direction of what was hypothesized by this study, it appears unlikely that increased power or sample size would result in the initial hypotheses of this study being supported.

Given the variable treatment approach seen in IHH services in CAMHD, where therapists are flexible and responsive to client factors in treatment, it might be beneficial to examine youth response to a structured treatment program, such as those used in previous research in which internalizing problems predicted increased externalizing problem improvement (e.g., Jarrett et al., 2014). Future research might assess diagnoses utilizing more structured diagnostic approaches, which could result in homogeneity within diagnostic grouping and therefore more representative of heterogeneous psychopathology between each other. Utilizing existing MTPS data, an examination of progress that includes therapist practices might account for some of these potential differences between groups in treatment that could implicate specific practices as particularly effective treatment approaches for specific diagnostic profiles. A more limited sample in terms of age (e.g., only examining adolescents) might also yield more homogeneous groups. Future research could measure psychopathology utilizing continuous measures of different problem areas, rather than the discrete measure of the presence or absence of a particular diagnosis (e.g., endorsement of specific treatment targets on the MTPS, CAFAS subscale ratings). Similarly, future investigation could examine whether the presence of more general internalizing problems interferes with disruptive behavior treatment response. Alternative measures of outcome could be examined (e.g., discharge status). Given the finding that increased DBP treatment targeting per month is significantly associated with lower DBP progress ratings, future research could examine whether increased treatment targeting in general is connected with lower progress ratings, both on DBP targets and on all progress ratings in general, to further clarify a possible connection between difficult treatment months and the endorsement of more targets of treatment.

## Appendix A: Monthly Treatment and Progress Summary (MTPS)

### SERVICE PROVIDER MONTHLY TREATMENT & PROGRESS SUMMARY Child and Adolescent Mental Health Division (CAMHD)

**Instructions:** Please complete and electronically submit this form to CAMHD by the 5<sup>th</sup> working day of each month (summarizing the time period of 1<sup>st</sup> to the last day of the previous month). The information will be used in service review, monitoring, planning and coordination in accordance with CAMHD policies and standards. Mahalo!

Client Name:	CR #:	DOB:
Month/Year of Services:	Eligibility Status:	Level of Care (one per form):
Axis I Primary Diagnosis:	Axis I Secondary Diagnosis:	Axis I Tertiary Diagnosis:
Axis II Primary Diagnosis:	Axis II Secondary Diagnosis:	

**Service Format (circle all that apply):**

Individual      Group      Parent      Family      Teacher      Other: \_\_\_\_\_

**Service Setting (circle all that apply):**

Home      School      Community      Out of Home      Clinic/Office      Other: \_\_\_\_\_

Service Dates:																	
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**Targets Addressed This Month (number up to 10):**

	Activity Involvement	Community Involvement	Hyperactivity	Positive Peer Interaction	Shyness
	Academic Achievement	Contentment, Enjoyment, Happiness	Learning Disorder, Underachievement	Phobia/Fears	Sleep Disturbance
	Adaptive Behavior/Living Skills	Depressed Mood	Low Self-Esteem	Positive Thinking/Attitude	Social Skills
	Adjustment to Change	Eating, Feeding Problems	Mania	Pregnancy Education/Adjustment	Speech and Language Problems
	Aggression	Empathy	Medical Regimen Adherence	Psychosis	Substance Use
	Anger	Enuresis, Encopresis	Occupational Functioning/Stress	Runaway	Suicidality
	Anxiety	Fire Setting	Oppositional/Non-Compliant Behavior	School Involvement	Traumatic Stress
	Assertiveness	Gender Identity Problems	Peer Involvement	School Refusal/Truancy	Treatment Engagement
	Attention Problems	Grief	Peer/Sibling Conflict	Self-Control	Willful Misconduct, Delinquency
	Avoidance	Health Management	Personal Hygiene	Self-Injurious Behavior	Other: _____
	Cognitive-Intellectual Functioning	Housing/Living Situation	Positive Family Functioning	Sexual Misconduct	Other: _____

CR # \_\_\_\_\_ (please repeat the number here)

**Progress Ratings This Month (check appropriate rating for any target numbers endorsed as targets):**

#	Deterioration < 0%	No Significant Changes 0%-10%	Minimal Improvement 11%-30%	Some Improvement 31%-50%	Moderate Improvement 51%-70%	Significant Improvement 71%-90%	Complete Improvement 91%-100%	Date (If Complete)
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

**Intervention Strategies Used This Month (check all that apply):**

Activity Scheduling	Emotional Processing	Line of Sight Supervision	Personal Safety Skills	Stimulus or Antecedent Control
Assertiveness Training	Exposure	Maintenance or Relapse Prevention	Physical Exercise	Supportive Listening
Attending	Eye Movement, Tapping	Marital Therapy	Play Therapy	Tangible Rewards
Behavioral Contracting	Family Engagement	Medication/ Pharmacotherapy	Problem Solving	Therapist Praise/Rewards
Biofeedback, Neurofeedback	Family Therapy	Mentoring	Psychoeducation, Child	Thought Field Therapy
Care Coordination	Free Association	Milieu Therapy	Psychoeducation, Parent	Time Out
Catharsis	Functional Analysis	Mindfulness	Relationship or Rapport Building	Twelve-Step Program
Cognitive	Goal Setting	Modeling	Relaxation	Other:
Commands	Guided Imagery	Motivational Interviewing	Response Cost	Other:
Communication Skills	Hypnosis	Natural and Logical Consequences	Response Prevention	Other:
Crisis Management	Ignoring/Differential Reinforcement of Other Behavior	Parent Coping	Self-Monitoring	
Cultural Training	Individual Therapy for Caregiver	Parent/Teacher Monitoring	Self-Reward/ Self-Praise	
Discrete Trial Training	Insight Building	Parent/Teacher Praise	Skill Building	
Educational Support	Interpretation	Peer Pairing	Social Skills Training	

CR # \_\_\_\_\_ (please repeat the number here)

Psychiatric Medications (List All)	Total Daily Dose	Dose Schedule	Check if Change	Description of Change
_____	_____	_____	<input type="checkbox"/>	_____
_____	_____	_____	<input type="checkbox"/>	_____
_____	_____	_____	<input type="checkbox"/>	_____
_____	_____	_____	<input type="checkbox"/>	_____
_____	_____	_____	<input type="checkbox"/>	_____

Projected Discharge Date: \_\_\_\_\_ ☐ Check if Discharged During Current Month

IF YOUTH WAS DISCHARGED THIS MONTH, PLEASE COMPLETE ITEMS A & B:

**A. Discharge Living Situation (check one):**

☐ Home                      ☐ Foster Home                      ☐ Group Care                      ☐ Residential Treatment  
☐ Institution/Hospital                      ☐ Jail/Correctional Facility                      ☐ Homeless/Shelter                      ☐ Other: \_\_\_\_\_

**B. Reason(s) for Discharge (check all that apply):**

☐ Success/Goals Met                      ☐ Insufficient Progress                      ☐ Family Relocation  
☐ Runaway/Elopement                      ☐ Refuse/Withdraw                      ☐ Eligibility Change                      ☐ Other: \_\_\_\_\_

**Outcome Measures:** Optional. If you have any of the following data, please report the most recent scores:

CAFAS (8 Scales): (1-School: ) (2-Home: ) (3-Community: ) (4-Behavior Toward Others: )	Date:		
(5-Moods/Emotions: ) (6-Self-Harm: ) (7-Substance: ) (8-Thinking: ) (Total: )			
CASH/CALOCUS (Total):	CASH/CALOCUS (Level of Care):	Date:	
CBCL (Total Problems T):	CBCL (Internalizing T):	CBCL (Externalizing T):	Date:
YSR (Total Problems T):	YSR (Internalizing T):	YSR (Externalizing T):	Date:
TRF (Total Problems T):	TRF (Internalizing T):	TRF (Externalizing T):	Date:
Arrested During Month? (Y/N):	School attendance (% of days):		

**Comments/Suggestions** (attach additional sheets if necessary):

Provider Agency & Island: _____	Clinician Name and ID#: _____
Provider Supervisor Signature: _____	Clinician Signature: _____
Submitted to CAMHD (date): _____	Care Coordinator: _____

## Appendix B: MTPS Instructions and Codebook

### DOH Child and Adolescent Mental Health Division Instructions and Codebook for Provider Monthly Treatment and Progress Summary Effective July 1, 2008

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*The instructions and codebook are to be used in conjunction with the CAMHD Service Provider Monthly Treatment and Progress Summary form. This codebook defines the numerous terms and possible responses necessary to accurately complete the form. For questions regarding these definitions or the use of the Monthly Treatment and Progress Summary, please contact the Clinical Services Office at 733-9349.*

#### Instructions

Please complete and electronically submit to CAMHD the Monthly Treatment and Progress Summary by the 5<sup>th</sup> working day of the month. The summary should pertain to the previous month's services. This form should be completed by the clinician who is most familiar with the current status of the youth and family and with the services provided during the month. When necessary, the responding clinician should gather information from other provider team members to assure the most accurate description possible. Once completed by the clinician, the form should be reviewed and signed by a qualified supervisor.

At the top section, please write the Client Name, CR Number, Date of Birth (DOB), Home School, School Complex, Eligibility Status [i.e., Educationally Supportive (IDEA), Support for Emotional and Behavioral Development (SEBD), Mental Health Only], Axis I Primary Diagnosis, Axis I Secondary Diagnosis, Axis I Tertiary Diagnosis, Axis II Primary Diagnosis, Axis II Secondary Diagnosis, Level of Care, and Month/Year of Services. If some Diagnosis fields do not apply to the youth, please leave those fields blank. The Month/Year of Services refers to the month in which the service was provided, not the date the Monthly Provider Summary was completed. For example, if the report is submitted in the first week of June, the Month/Year of Services would read "May," because the services were delivered in May. For youth receiving more than one level of care during the month, please complete a separate form for each.

Under Service Format, please indicate whether services were delivered in the following manner (more than one format can be selected):

- Individual –Working with youth directly
- Group –Working with youth along with other youths receiving services
- Parent –Working directly with parents or caregivers, with youth not present
- Family – Working with parents or caregivers and youth together. Can include other family members
- Teacher – Working with a teacher directly
- Other – Another format not specified above; please write description

Under Service Setting, please note whether services were delivered in the following locations (more than one setting can be selected):

## CAMHD Provider Monthly Summary Instructions and Codebook

Home –Working with youth or family members in the youth’s home  
School –Working with youth or professionals in the youth’s educational setting, other than in the context of an IEP/MP meeting  
Community – Working with youth or others in the youth’s community/neighborhood  
Out of Home – Working with the youth or family in a residential facility  
Clinic/Office – Working with the youth or family in a clinical office  
Other – Another setting not specified above; please write description

For Service Dates, please provide the dates for each service provided during that month. If additional space is required, please continue writing dates in the area below the boxes provided. If the service was provided out of home (i.e., continuously), please provide start and end dates for that month’s services and put the word “to” in between in one of the boxes.

### Targets

Targets are the strengths and needs being addressed as part of the mental health services for that youth.

When completing the Targets Addressed This Month, please put numbers (1, 2, 3...) rather than checkmarks (X, ✓) to the left of each target addressed. This is so that progress ratings in the next section can be attached to each target. For example, if “Academic Achievement” was targeted, place a “1” in the box to the left of that target on the form. Numbers do not need to reflect any particular order. If more than 10 targets were addressed during the month, please provide only those you feel are the 10 most important. If a target was addressed for which there is no option, please number the “other” box, and write in the target.

The list of treatment targets is intended to provide a summary of strengths and needs that are commonly targeted for change during mental health service provision. These problem areas are NOT diagnostic descriptions and the primary targets for treatment may change over time for a particular youth. For example, when treating a youth with an eating disorder, treatment may target eating/feeding behavior at one point, but target medical regimen adherence or positive family functioning on other occasions. These treatment targets are for progress summary purposes and should NOT replace the detailed specification of goals and objectives as part of the treatment planning process.

### Definitions of Targets

1. **Academic Achievement** – Issues related to general level or quality of achievement in an educational or academic context. This commonly includes performance in coursework, and excludes cognitive-intellectual ability/capacity issues (#11) and specific challenges in learning or achievement (#24)
2. **Activity Involvement** – Issues related to general engagement and participation in activities. Only code here those activities that are not better described by the particular activity classes of school involvement (#40), peer involvement (#30), or community involvement (#12).
3. **Adaptive Behavior/Living Skills** – Skills related to independent living, social functioning, financial management, and self-sufficiency that are not better captured under other codes



## CAMHD Provider Monthly Summary Instructions and Codebook

such as personal hygiene (#33), self-management/self-control (#43), social skills (#47), housing/living situation (#22), or occupational functioning/stress (#28).

4. **Adjustment to Change** – Issues related to a youth's global response to a life transition or specific challenge (e.g., change of school, living situation, treatment transition or discharge, etc.).
5. **Aggression** – Verbal and/or physical aggression, or threat thereof, that results in intimidation, physical harm, or property destruction.
6. **Anger** – Emotional experience or expression of agitation or destructiveness directed at a particular object or individual. Common physical feelings include accelerated heartbeat, muscle tension, quicker breathing, and feeling hot.
7. **Anxiety** – A general uneasiness that can be characterized by irrational fears, panic, tension, physical symptoms, excessive anxiety, worry, or fear.
8. **Assertiveness** – The skills or effectiveness of clearly communicating one's wishes. For example, the effectiveness with which a child refuses unreasonable requests from others, expresses his/her rights in a non-aggressive manner, and/or negotiates to get what s/he wants in their relationships with others.
9. **Attention Problems** – Described by short attention span, difficulty sustaining attention on a consistent basis, and susceptible to distraction by extraneous stimuli.
10. **Avoidance** – Behaviors aimed at escaping or preventing exposure to a particular situation or stimulus.
11. **Cognitive-Intellectual Functioning** – Issues related to cognitive-intellectual ability/capacity and use of those abilities for positive adaptation to the environment. This includes efforts to increase IQ, memory capacity, or abstract problem-solving ability.
12. **Community Involvement** – Issues related to the amount of involvement in specific community activities within the child's day.
13. **Contentment/Enjoyment/Happiness** – Refers to issues involving the experience and expression of satisfaction, joy, pleasure, and optimism for the future.
14. **Depressed Mood** – Behaviors that can be described as persistent sadness, anxiety, or "empty" mood, feelings of hopelessness, guilt, worthlessness, helplessness, decreased energy, fatigue, etc.
15. **Eating/Feeding Problems** – Knowledge or behaviors involved with the ingestion or consumption of food. May include nutritional awareness, food choice, feeding mechanics (e.g., swallowing, gagging, etc.), and social factors relating with eating situations.
16. **Empathy** – Identifications with and understanding of another person's situation, feelings, and motives.
17. **Enuresis/Encopresis** – Enuresis refers to the repeated pattern of voluntarily or involuntarily passing urine at inappropriate places during the day or at night in bed or clothes. Encopresis refers to a repeated pattern of voluntarily or involuntarily passing feces in inappropriate places.
18. **Fire Setting** – Intentionally igniting fires.
19. **Gender Identity Problems** – Issues related with a youth's self-concept or self-understanding involving gender roles and social behaviors in relation to their biological sex. This does not address self-concept issues involving sexual orientation, which would be coded as "other."
20. **Grief** – Feelings associated with a loss of contact with a significant person in the youth's environment (e.g., parent, guardian, friend, etc.).

## CAMHD Provider Monthly Summary Instructions and Codebook

21. **Health Management** – Issues related to the improvement or management of one’s health, inclusive of both physical illness and fitness. In addition to dealing with the general development of health-oriented behavior and management of health conditions, this target can also focus on exercise or lack of exercise.
22. **Housing/Living Situation** – Refers to finding or stabilizing an appropriate living situation for a youth.
23. **Hyperactivity** – Can be described by fidgeting, squirming in seat, inability to remain seated, talking excessively, difficulty engaging in leisure activities quietly, etc.
24. **Learning Disorder, Underachievement** – Refers to specific challenges with learning or educational performance that are not better accounted for by cognitive-intellectual functioning (#11) or general academic achievement (#1).
25. **Low Self-Esteem** – An inability to identify or accept his/her positive traits or talents, and accept compliments. Verbalization of self-disparaging remarks and viewing him or herself in a negative manner.
26. **Mania** – An inflated self-perception that can be manifested by loud, overly friendly social style that oversteps social boundaries, and high energy and restlessness with a reduced need for sleep.
27. **Medical Regimen Adherence** – Knowledge, attitudes, and behaviors related to regular implementation procedures prescribed by a health care professional. Commonly include lifestyle behaviors (e.g., exercise, nutrition), taking medication, or self-administration of routine assessments (e.g., taking blood samples in a diabetic regimen).
28. **Occupational Functioning/Stress** – Issues related to career interests, seeking employment, obtaining work permits, job performance, or managing job stress or strain that are not better characterized under other targets (e.g., anxiety).
29. **Oppositional/Non-Compliant Behavior** – Behaviors that can be described as refusal to follow adult requests or demands or established rules and procedures (e.g., classroom rules, school rules, etc.).
30. **Peer Involvement** – A greater involvement in activities with peers. Activities could range from academic tasks to recreational activities while involvement could range from working next to a peer to initiating an activity with a peer.
31. **Peer/Sibling Conflict** – Peer and/or sibling relationships that are characterized by fighting, bullying, defiance, revenge, taunting, incessant teasing and other inappropriate behaviors.
32. **Phobia/Fears** – Irrational dread, fear, and avoidance of an object, situation, or activity.
33. **Personal Hygiene** – Challenges related to self-care and grooming.
34. **Positive Family Functioning** – Issues related with healthy communication, problem-solving, shared pleasurable activities, physical and emotional support, etc. in the context of an interaction among multiple persons in a family relation, broadly defined.
35. **Positive Peer Interaction** – Social interaction and communication with peers that are pro-social and appropriate. This differs from peer involvement (#30) in that it focuses on interactional behavior, styles, and intentions, whereas peer involvement targets actual engagement in activities with peers regardless of interactional processes.
36. **Positive Thinking/Attitude** – This target involves clear, healthy, or optimistic thinking, and involves the absence of distortions or cognitive bias that might lead to maladaptive behavior.
37. **Pregnancy Education/Adjustment** – Issues related to helping a pregnant youth prepare and adjust to parenthood.

### CAMHD Provider Monthly Summary Instructions and Codebook

38. **Psychosis** – Issues related to atypical thought content (delusions of grandeur, persecution, reference, influence, control, somatic sensations), and/or auditory or visual hallucinations.
39. **Runaway** – Running away from home or current residential placement for a day or more.
40. **School Involvement** – Detailed description of amount of involvement in specific school activities within the child's scheduled school day.
41. **School Refusal/Truancy** – Reluctance or refusal to attend school without adult permission for the absence. May be associated with school phobia or fear manifested by frequent somatic complaints associated with attending school or in anticipation of school attendance, or willful avoidance of school in the interest of pursuing other activities.
42. **Self-Injurious Behavior** – Acts of harm, violence, or aggression directed at oneself.
43. **Self-Management/Self-Control** – Issues related to management, regulation, and monitoring of one's own behavior.
44. **Sexual Misconduct** – Issues related with sexual conduct that is defined as inappropriate by the youth's social environment or that includes intrusion upon or violation of the rights of others.
45. **Shyness** – Social isolation and/or excessive involvement in isolated activities. Extremely limited or no close friendships outside the immediate family members. Excessive shrinking or avoidance of contact with unfamiliar people.
46. **Sleep Disturbance** – Difficulty getting to or maintaining sleep.
47. **Social Skills** – Skills for managing interpersonal interactions successfully. Can include body language, verbal tone, assertiveness, and listening skills, among other areas.
48. **Speech and Language Problems** – Expressive and/or receptive language abilities substantially below expected levels as measured by standardized tests.
49. **Substance Abuse/Substance Use** – Issues related to the use or misuse of a common, prescribed, or illicit substances for altering mental or emotional experience or functioning.
50. **Suicidality** – Issues related to recurrent thoughts, gestures, or attempts to end one's life.
51. **Traumatic Stress** – Issues related to the experience or witnessing of life events involving actual or threatened death or serious injury to which the youth responded with intense fear, helplessness, or horror.
52. **Treatment Engagement** – The degree to which a family or youth is interested and optimistic about an intervention or plan, such that they act willfully to participate and work toward the success of the plan.
53. **Willful Misconduct/Delinquency** – Persistent failure to comply with rules or expectations in the home, school, or community. Excessive fighting, intimidation of others, cruelty or violence toward people or animals, and/or destruction of property.

### Progress Ratings

Please provide a single progress rating for each target selected above (up to 10). Numbers 1 through 10 in the left column refer to the targets selected in the Targets Addressed This Month section above. For example, had you selected "Academic Achievement" above, there would be a "1" in the box to the left of that target on that section. Then, the first row of the Progress Ratings, labeled "1," is where you would note the progress ratings associated with academic achievement.

Please place a mark (X, ✓) in the column corresponding to your subjective rating of progress associated with this target. When possible, your overall subjective ratings should be informed by

## CAMHD Provider Monthly Summary Instructions and Codebook

a review of objective measures such as any available and relevant questionnaires or behavioral observation data. For example, if a youth receives a T-score of 70 during an intake assessment and the treatment goal is to reduce this score to 60, then if a youth receives a T-score of 65 during a monthly assessment, then 50% progress may be reported [i.e.,  $70 - 65 / 70 - 60 = 5 / 10 = 50\%$ ]. Or if a youth gets into 10 fights per week initially and the treatment goal is to reduce fighting to 0 fights per week, then during a month in which the youth was fighting only 3 times per week, that would reflect 70% progress [i.e.,  $10 - 3 / 10 - 0 = 7 / 10 = 70\%$ ].

**Anchors refer to changes from baseline or beginning of services for that target.** Thus, a youth who had reached 90% of an initial goal would receive a rating of “significant improvement.” If that progress were to decline to 70% in the following month, the youth would then get a rating of “moderate improvement” for that target for that month (not “deterioration”). “Deterioration” refers to when a target gets worse from the time it was initially addressed. If there is a break in addressing a specific target (e.g., a target is addressed, then not addressed for a month, then addressed again in a later month), use the initial baseline from the first time as the point of comparison. Only when there is a break in the complete episode of care (i.e., discharge followed by later admission), should that reset the baseline for a given target.

If a goal is reached (improvement is complete), the provider may choose to note the date in the rightmost column. This implies that the target is no longer being addressed. Targets that are not complete should be rated again on the following month’s summary form.

### Intervention Strategies

Please place a mark (X, ✓) to the left of any intervention strategies used during the past month. There is no limit to how many may be checked. If strategies were employed that are not in the following list of definitions, please mark the “other” box and write in the strategy used.

### Definitions of Intervention Strategies

1. **Activity Scheduling** – The assignment or request that a child participate in specific activities outside of therapy time, with the goal of promoting or maintaining involvement in satisfying and enriching experiences.
2. **Assertiveness Training** – Exercises or techniques designed to promote the child’s ability to be assertive with others, usually involving rehearsal of assertive interactions.
3. **Attending** – Exercises involving the youth and caregiver playing together in a specific manner to facilitate their improved verbal communication and nonverbal interaction. Can involve the caregiver’s imitation and participation in the youth’s activity, as well as parent-directed play (previously called “Directed Play”).
4. **Behavioral Contracting** – Development of a formal agreement specifying rules, consequences, and a commitment by the youth and relevant others to honor the content of the agreement.
5. **Biofeedback/ Neurofeedback** – Strategies to provide information about physiological activity that is typically below the threshold of perception, often involving the use of specialized equipment.

## CAMHD Provider Monthly Summary Instructions and Codebook

6. **Care Coordination** – Coordinating among the youth's service providers to ensure effective communication, receipt of appropriate services, adequate housing, etc.
7. **Catharsis** – Strategies designed to bring about the release of intense emotions, with the intent to develop mastery of affect and conflict.
8. **Cognitive** – Any techniques designed to alter interpretation of events through examination of the child's reported thoughts, typically through the generation and rehearsal of alternative counter-statements. This can sometimes be accompanied by exercises designed to comparatively test the validity of the original thoughts and the alternative thoughts through the gathering or review of relevant information.
9. **Commands** – Training for caregivers in how to give directions and commands in such a manner as to increase the likelihood of child compliance.
10. **Communication Skills** – Training for youth or caregivers in how to communicate more effectively with others to increase consistency and minimize stress. Can include a variety of specific communication strategies (e.g., active listening, "I" statements).
11. **Crisis Management** – Immediate problem solving approaches to handle urgent or dangerous events. This might involve defusing an escalating pattern of behavior and emotions either in person or by telephone, and is typically accompanied by debriefing and follow-up planning.
12. **Cultural Training** – Education or interaction with culturally important values, rituals, or sites with no specific practices identified.
13. **Discrete Trial Training** – A method of teaching involving breaking a task into many small steps and rehearsing these steps repeatedly with prompts and a high rate of reinforcement.
14. **Educational Support** – Exercises designed to assist the child with specific academic problems, such as homework or study skills. This includes tutoring.
15. **Emotional Processing** – A program based on an information processing model of emotion that requires activation of emotional memories in conjunction with new and incompatible information about those memories.
16. **Exposure** – Techniques or exercises that involve direct or imagined experience with a target stimulus, whether performed gradually or suddenly, and with or without the therapist's elaboration or intensification of the meaning of the stimulus.
17. **Eye Movement/ Tapping** – A method in which the youth is guided through a procedure to access and resolve troubling experiences and emotions, while being exposed to a therapeutic visual or tactile stimulus designed to facilitate bilateral brain activity.
18. **Family Engagement** – The use of skills and strategies to facilitate family or child's positive interest in participation in an intervention.
19. **Family Therapy** – A set of approaches designed to shift patterns of relationships and interactions within a family, typically involving interaction and exercises with the youth, the caregivers, and sometimes siblings.
20. **Free Association** – Technique for probing the unconscious in which a person recites a running commentary of thoughts and feelings as they occur.
21. **Functional Analysis** – Arrangement of antecedents and consequences based on a functional understanding of a youth's behavior. This goes beyond straightforward application of other behavioral techniques.
22. **Goal Setting** – Setting specific goals and developing commitment from youth or family to attempt to achieve those goals (e.g., academic, career, etc.).

## CAMHD Provider Monthly Summary Instructions and Codebook

23. **Guided Imagery** – Visualization or guided imaginal techniques for the purpose of mental rehearsal of successful performance. Guided imagery for the purpose of physical relaxation (e.g., picturing calm scenery) is not coded here, but rather coded under relaxation (#50).
24. **Hypnosis** – The induction of a trance-like mental state achieved through suggestion.
25. **Ignoring/Differential Reinforcement of Other Behavior** – The training of parents or others involved in the social ecology of the child to selectively ignore mild target behaviors and selectively attend to alternative behaviors.
26. **Individual Therapy for Caregiver** – Any therapy designed directly to target individual (non-dyadic) psychopathology in one or more of the youth's caregivers. If the therapy for caregivers involves marital therapy (#31) or communication skills (#10) those are not coded here, unless there are additional services for individual caregiver psychopathology, in which case all that apply should be coded.
27. **Insight Building** – Activity designed to help a youth achieve greater self-understanding.
28. **Interpretation** – Reflective discussion or listening exercises with the child designed to yield therapeutic interpretations. This does not involve targeting specific thoughts and their alternatives, which would be coded as cognitive/coping.
29. **Line of Sight Supervision** – Direct observation of a youth for the purpose of assuring safe and appropriate behavior.
30. **Maintenance/Relapse Prevention** – Exercises and training designed to consolidate skills already developed and to anticipate future challenges, with the overall goal to minimize the chance that gains will be lost in the future.
31. **Marital Therapy** – Techniques used to improve the quality of the relationship between caregivers.
32. **Medication/ Pharmacotherapy** – Any use of psychotropic medication to manage emotional, behavioral, or psychiatric symptoms.
33. **Mentoring** – Pairing with a more senior and experienced individual who serves as a positive role model for the identified youth.
34. **Milieu Therapy** – A therapeutic approach in residential settings that involves making the environment itself part of the therapeutic program. Often involves a system of privileges and restrictions such as a token or point system.
35. **Mindfulness** – Exercises designed to facilitate present-focused, non-evaluative observation of experiences as they occur, with a strong emphasis of being “in the moment.” This can involve the youth's conscious observation of feelings, thoughts, or situations.
36. **Modeling** – Demonstration of a desired behavior by a therapist, confederates, peers, or other actors to promote the imitation and subsequent performance of that behavior by the identified youth.
37. **Motivational Interviewing** – Exercises designed to increase readiness to participate in additional therapeutic activity or programs. These can involve cost-benefit analysis, persuasion, or a variety of other approaches.
38. **Natural and Logical Consequences** – Training for parents or teachers in (a) allowing youth to experience the negative consequences of poor decisions or unwanted behaviors, or (b) delivering consequences in a manner that is appropriate for the behavior performed by the youth.

### CAMHD Provider Monthly Summary Instructions and Codebook

- 39. **Parent Coping** – Exercises or strategies designed to enhance caregivers’ ability to deal with stressful situations, inclusive of formal interventions targeting one or more caregiver.
- 40. **Parent/Teacher Monitoring** – The repeated measurement of some target index by the parent, teacher, or other adult involved in the child’s social ecology.
- 41. **Parent/Teacher Praise** – The training of parents, teachers, or other adults involved in the social ecology of the child in the administration of social rewards to promote desired behaviors. This can involve praise, encouragement, affection, or physical proximity.
- 42. **Peer Pairing** – Pairing with another youth of same or similar age to allow for reciprocal learning or skills practice.
- 43. **Personal Safety Skills** – Training for the youth in how to maintain personal safety of one’s physical self. This can include education about attending to one’s sense of danger, body ownership issues (e.g., “good touch-bad touch”), risks involved with keeping secrets, how to ask for help when feeling unsafe, and identification of other high-risk situations for abuse.
- 44. **Physical Exercise** – The engagement of the youth in energetic physical movements to promote strength or endurance or both. Examples can include running, swimming, weight-lifting, karate, soccer, etc. Note that when the focus of the physical exercise is also to produce talents or competence and not just physical activity and conditioning, the code for “Skill Building” (#55) can also be applied.
- 45. **Play Therapy** – The use of play as a primary strategy in therapeutic activities. This may include the use of play as a strategy for clinical interpretation. Different from Attending (#3), which involves a specific focus on modifying parent-child communication. This is also different from play designed specifically to build relationship quality (#49).
- 46. **Problem Solving** – Techniques, discussions, or activities designed to bring about solutions to targeted problems, usually with the intention of imparting a skill for how to approach and solve future problems in a similar manner.
- 47. **Psychoeducational-Child** – The formal review of information with the child about the development of a problem and its relation to a proposed intervention.
- 48. **Psychoeducational-Parent** – The formal review of information with the caregiver(s) about the development of the child’s problem and its relation to a proposed intervention. This often involves an emphasis on the caregiver’s role in either or both.
- 49. **Relationship/Rapport Building** – Strategies in which the immediate aim is to increase the quality of the relationship between the youth and the therapist. Can include play, talking, games, or other activities.
- 50. **Relaxation** – Techniques or exercises designed to induce physiological calming, including muscle relaxation, breathing exercises, meditation, and similar activities. Guided imagery exclusively for the purpose of physical relaxation is also coded here.
- 51. **Response Cost** – Training parents or teachers how to use a point or token system in which negative behaviors result in the loss of points or tokens for the youth.
- 52. **Response Prevention** – Explicit prevention of a maladaptive behavior that typically occurs habitually or in response to emotional or physical discomfort.
- 53. **Self-Monitoring** – The repeated measurement of some target index by the child.
- 54. **Self-Reward/Self-Praise** – Techniques designed to encourage the youth to self-administer positive consequences contingent on performance of target behaviors.

### CAMHD Provider Monthly Summary Instructions and Codebook

55. **Skill Building** – The practice or assignment to practice or participate in activities with the intention of building and promoting talents and competencies.
56. **Social Skills Training** – Providing information and feedback to improve interpersonal verbal and non-verbal functioning, which may include direct rehearsal of the skills. If this is paired with peer pairing (#42), that should be coded as well.
57. **Stimulus/Antecedent Control** – Strategies to identify specific triggers for problem behaviors and to alter or eliminate those triggers in order to reduce or eliminate the behavior.
58. **Supportive Listening** – Reflective discussion with the child designed to demonstrate warmth, empathy, and positive regard, without suggesting solutions or alternative interpretations.
59. **Tangible Rewards** – The training of parents or others involved in the social ecology of the child in the administration of tangible rewards to promote desired behaviors. This can involve tokens, charts, or record keeping, in addition to first-order reinforcers.
60. **Therapist Praise/Rewards** – The administration of tangible (i.e., rewards) or social (e.g., praise) reinforcers by the therapist.
61. **Thought Field Therapy** – Techniques involving the tapping of various parts of the body in particular sequences or "algorithms" in order to correct unbalanced energies, known as thought fields.
62. **Time Out** – The training of or the direct use of a technique involving removing the youth from all reinforcement for a specified period of time following the performance of an identified, unwanted behavior.
63. **Twelve-Step Program** – Any programs that involve the twelve-step model for gaining control over problem behavior, most typically in the context of alcohol and substance use, but can be used to target other behaviors as well.

For medication interventions please list each psychiatric medication the youth is taking (e.g., Adderall ER), describe the prescribed total daily dose for each medication (e.g., 30 mg.), identify the prescribed dose schedule (e.g., 2x/week, 3x/day, 15-10-5/day, etc.), place a check mark in the appropriate box if there was a change in the medication or regimen during the reporting month, and provide a description of the change on the line to the right (e.g., new medication, daily dosage change from 10 to 30 mg, change in dose schedule from 5-5/day to 10-10-10/day, etc.).

For Projected End Date, please indicate the expected date for termination of the services for which this form was completed.

For Discharged During Month please indicate if the youth was discharged from your program during the reporting month. If the youth was discharged, please indicate the Living Situation that the youth was entering upon discharge and the Reason for Discharge. For Projected End Date, please indicate the expected date for termination of the services for which this form was completed.



## CAMHD Provider Monthly Summary Instructions and Codebook

### Living Situation upon Discharge

Please place a mark (X, ✓) to the left of statement that best describes the type of living environment in which the youth was expected to reside at the time of discharge. Please select only one option. If the youth's living situation at discharge is not well described by the following list of definitions, please mark the "other" box and write in the youth's living situation.

1. **Home** - Youth to live in a house, apartment, trailer, hotel, dorm, barrack, and/or single room occupancy. This excludes situations better characterized as foster homes.
2. **Foster Home**-Youth to reside in a foster home or therapeutic foster home. A foster home is a home that is licensed to provide foster care to children, adolescents, and/or adults.
3. **Group Care**-Youth to reside in a group care facility. This level of care may include a group home, therapeutic group home, or board and care. This excludes community-based residential and hospital-based residential care
4. **Residential Treatment**- Youth to reside in a community-based residential treatment, rehabilitation center, or other residential treatment that is not better characterized as a group home or institution/hospital facility. An organization, not licensed as a psychiatric hospital, whose primary purpose is the provision of individually planned programs of mental health treatment services in conjunction with residential care for children and youth. The services are provided in facilities that are certified by state or federal agencies or through a national accrediting agency.
5. **Institutional/Hospital**-Youth resides in an institutional care or hospital-based residential care facility with care provided on a 24 hour, 7 day a week basis. This level of care may include a skilled nursing/intermediate care facility, nursing homes, institutes of mental disease, inpatient psychiatric hospital, psychiatric health facility, Veterans Affairs hospital, or state hospital.
6. **Jail/Correctional Facility**-Youth resides in a Jail and/or Correctional facility with care provided on a 24 hour, 7 day a week basis. This level of care may include a jail, correctional facility, detention centers, prison, youth authority facility, juvenile hall, boot camp, or boys ranch.
7. **Homeless/Shelter**- A youth is considered homeless if s/he lacks a fixed, regular, and adequate nighttime residence or his/her primary nighttime residency is a supervised publicly or privately operated shelter designed to provide temporary living accommodations, an institution that provides a temporary residence for individuals intended to be institutionalized, or a public or private place not designed for, or ordinarily used as, a regular sleeping accommodation for human beings (e.g., on the street). Youth who were discharged due to extended runaway or elopement episode should be recorded in this category.

### Reason(s) for Discharge

Please place a mark (X, ✓) to the left of each statement that describes the reasons for discharging youth from the program during the reporting month. There is no limit to how many may be checked. If the discharge reason is not well characterized by the following list of definitions, please mark the "other" box and write in the reason.

### CAMHD Provider Monthly Summary Instructions and Codebook

1. **Success/Goals Met**-Youth was clinically discharged due to sufficient treatment progress (e.g., symptoms reduced, functioning improved), treatment goals were met, youth was evaluated and services were determined unnecessary, services were completed, or youth was moving to a less restrictive and intensive level of care.
2. **Insufficient Progress**-Youth was discharged from service without showing sufficient treatment progress to be judged as clinically successful (i.e., little symptom reduction, improvement in functioning, or goal attainment was achieved).
3. **Family Relocation**-Youth was discharge because the youth and family moved out of state or out of the service area.
4. **Runaway/Elopement**-Youth was discharged in association with an extended period of unavailability for treatment because the youth had runaway from home or eloped from the program.
5. **Refuse/Withdraw**-Youth was discharged due to parental refusal, non-participation in treatment, lack of consent, or other indication that client withdrew from services against professional advice.
6. **Eligibility Change**-Youth was discharged in association with a change in eligibility for services, such as a termination of a court order or commitment, aging out of child and adolescent services, loss of Medicaid insurance, etc.

Please provide any other Comments or Suggestions for the youth's care coordinator you think would be important.

If scores are available on any of the Outcome Measures recommended in the Interagency Practice Guidelines, please provide them along with dates in the optional section provided. Include whether or not youth was arrested during the past month, and an estimate of the percentage of school days that were attended. If school is attended in a residential setting, this counts toward the percentage of days attended.

For the CAFAS, the numbered spaces refer to the following scales: 1-School, 2-Home, 3-Community, 4-Behavior Towards Others, 5-Moods/Emotions, 6-Self-Harm, 7-Substance, 8-Thinking. "Total" refers to the sum of these 8 scales.

Please write the name of the agency including location (e.g., Maui, Big Island) and name of the clinicians (along with CAMHMIS ID#) and provider, along with appropriate signatures of the clinician completing the form and the qualified supervisor. Note the date that the form was submitted electronically to CAMHD and provide name of Care Coordinator.

## Appendix C: Child and Adolescent Functional Assessment Scale (CAFAS)

### CAFAS™ PROFILE: YOUTH'S FUNCTIONING

Youth's Name \_\_\_\_\_ ID# \_\_\_\_\_ Rater \_\_\_\_\_ Date \_\_\_\_/\_\_\_\_/\_\_\_\_ Site \_\_\_\_\_

Level of Impairment	Role Performance: School/Work	Role Performance: Home	Role Performance: Community	Behavior Toward Others	Moods/ Self-Harm: Moods/ Emotions	Moods/ Self-Harm: Self-Harmful Behavior	Substance Use	Thinking
SEVERE 30	1 2 3 4 5 6 7 8 9 10 11	41 42 43 44 45 46 47 48 49 50	66 67 68 69 70 71 72	88 89 90 91 92	116 117 118 119 120	142 143 144 145	154 155 156 157 158 159 160 161 162 163 164	182 183 184 185 186
MODERATE 20	12 13 14 15 16 17 18 19 20 21	81 82 83 84 85 86	73 74 75 76 77 78 79	93 94 95 96 97 98 99 100 101 102	121 122 123 124 125 126 127	146 147 148	165 166 167 168 169 170 171	187 188 189 190 191 192
MILD 10	22 23 24 25 26 27	57 58 59 60 61	80 81 82 83	103 104 105 106 107 108 109 110	128 129 130 131 132 133 134 135	149 150	172 173 174 175	193 194 195 196 197
MINIMAL/NO 0	28 29 30 31 32 33 34 35 36 37 38 39	62 63 64	84 85 86	111 112 113 114	136 137 138 139 140	151 152	176 177 178 179 180	198 199
COULD NOT SCORE	40	65	87	115	141	153	181	200

For each scale: (1) mark the item number(s) which corresponds to those marked on the CAFAS™ form, (2) fill in the circle indicating severity level, (3) connect the circles.

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